

# B.K.ELLIOTT CO.

DRAWING MATERIALS AND  
SURVEYING INSTRUMENTS

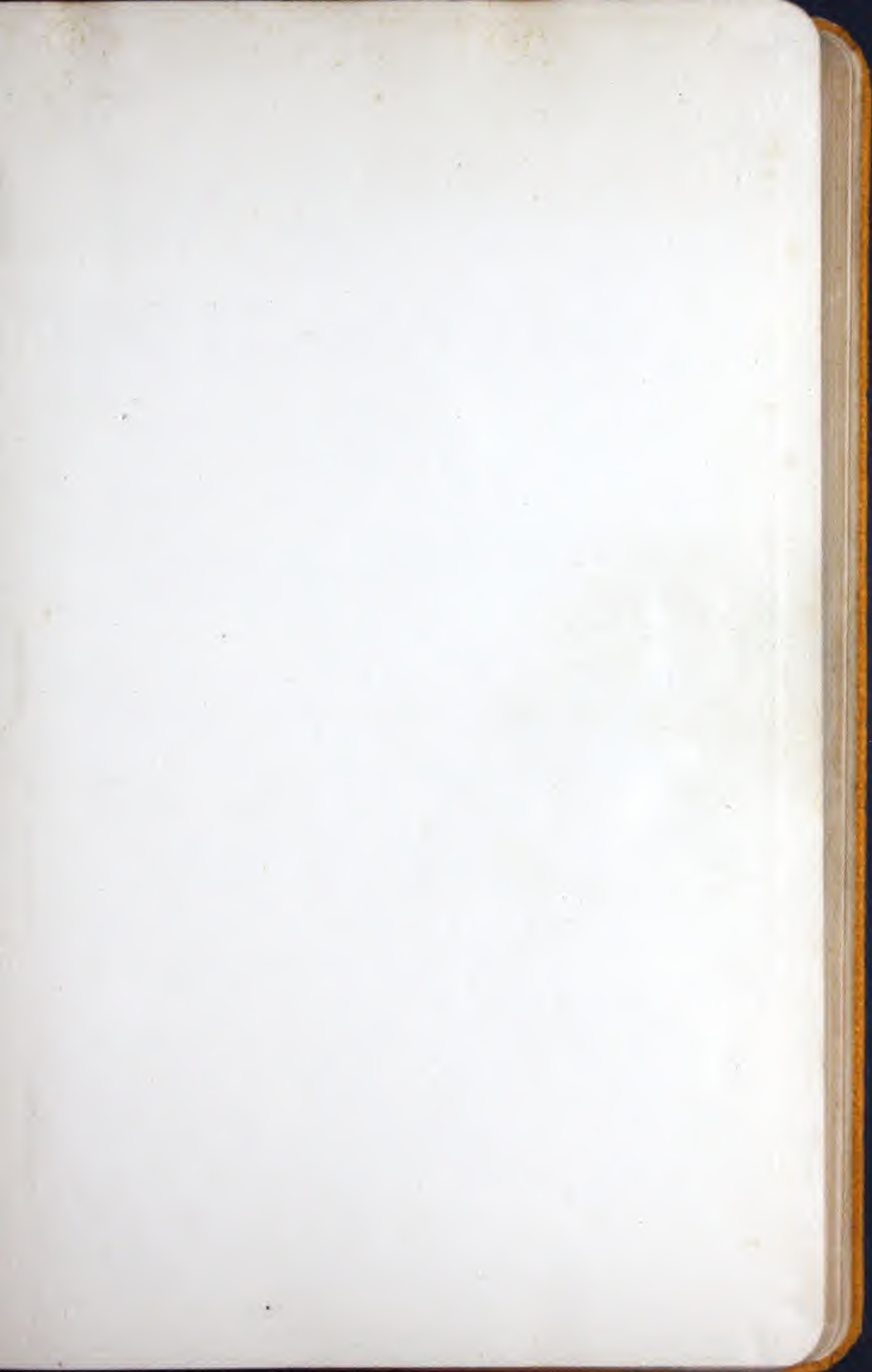


PITTSBURGH, PA.  
BRANCH - CLEVELAND, O.



This is Catalogue

Nº 9043









CATALOGUE  
AND PRICE LIST

THIRD EDITION

OF

B. K. ELLIOTT CO.

Manufacturers and  
Importers of

Drawing Materials

and

Surveying Instruments

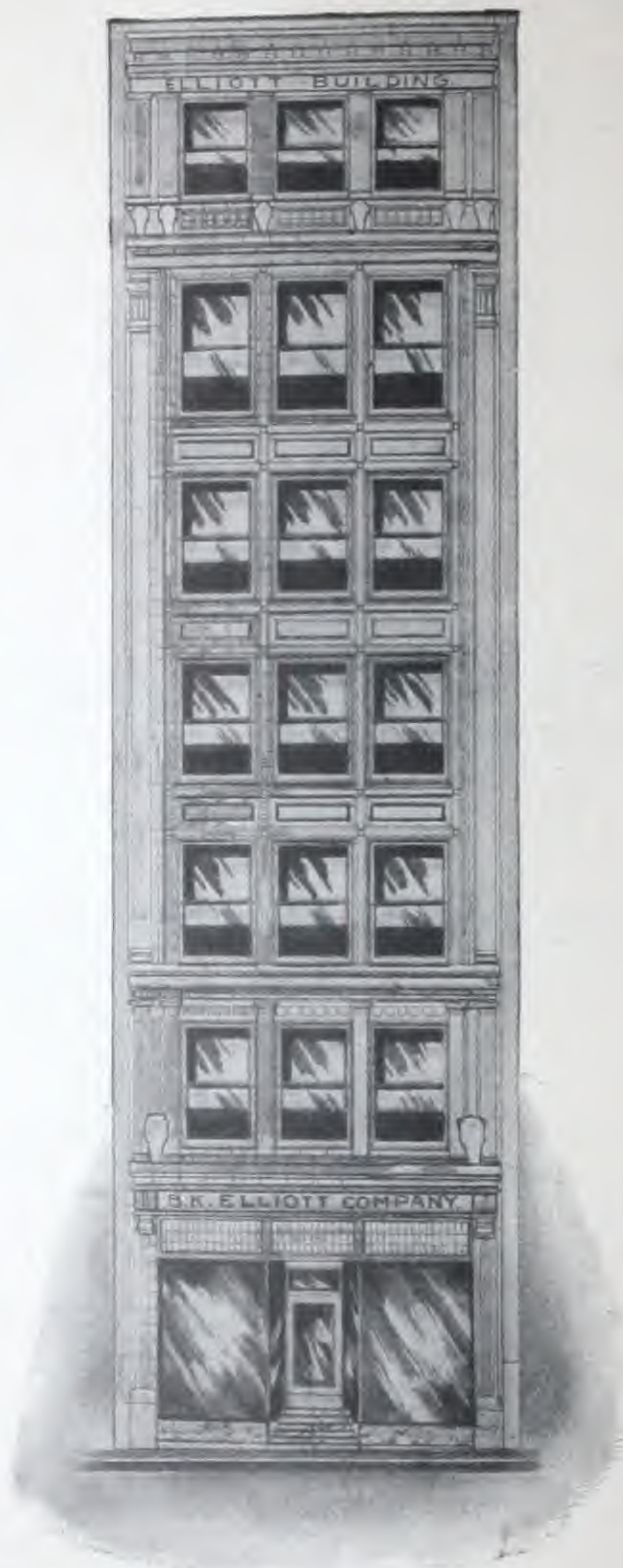
126 Sixth Street  
PITTSBURGH, PA.

Cable Address, "BLUEPRINT"

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Branch  
733 - 735 Prospect Avenue  
CLEVELAND, OHIO





GENERAL OFFICE, SALES AND SHIPPING DEPT.  
126 Sixth Street, Pittsburgh, Pa.





WE are pleased to offer this third edition of our catalogue to our customers and request for it the same kind consideration given our previous editions.

Many additions are shown, and in adding these, care has been taken that the same high standard is maintained as heretofore.

Our factory and warehouse covers fifty percent more space than we occupied when our last catalog was issued, and is equipped with every modern convenience. Our battery of coating machines, for producing our high grade Blue and Brown Print Papers and Cloths, are being operated to the limit of their productive power each day, and our Surveying Instrument factory is pushed to the utmost all the time to keep abreast of orders.

Our Blue Print department is equipped with the latest type of Electric Blue Printing Apparatus and contains special equipment for quick drying and ironing of prints, therefore giving it enormous capacity.

Our Retail Department is manned by trained salesmen, insuring prompt and courteous attention to all visitors.

Our Main Office and Factory is located in Pittsburgh, Pa., but we are operating a well-stocked branch house in Cleveland, Ohio.

Courteous treatment, and honest materials and prices, to customers are the means we have employed to secure the national trade now enjoyed by us, and we intend to maintain the splendid reputation we now have for fair dealing.

All goods are guaranteed to be exactly as represented, and any article found unsatisfactory may be returned to us and it will be promptly replaced or money refunded.

Respectfully,

B. K. ELLIOTT COMPANY.

**All prices subject to change without notice.**



## NOTICE

To avoid delay in making shipments and to lessen the possibility of errors in filling orders, close observance of the following directions are requested.

**DESCRIPTION.**—Specify list number of the article, and in some cases the size, thickness, color, length, width, etc., and on Blue Print Papers and Cloths the printing speed.

**SHIPPING DIRECTIONS.**—Always state whether you desire the goods shipped by parcels post, express or freight, if by freight, specify route preferred. Shipments weighing sixty pounds or less may be sent by express more advantageously and in most instances more cheaply than by freight.

**PARCELS POST.**—Parcels Post packages will be forwarded at the Customers risk and all such shipments are insured. The postage and the small insurance premium are **added to the invoice**.

**EXPRESS.**—If desired, express shipments will be forwarded prepaid, and charges **added to the invoice**.

**FREIGHT.**—Freight shipments usually require wooden cases, the cost of which will be **added to the invoice**.

When no shipping directions are specified, goods will be forwarded according to our best judgment.

While we use the greatest care in making shipments, we are not responsible for goods damaged or lost in transit, and our responsibility ends when delivered to the carrier and in case of damaged or lost shipments, claim should be made to the carrier. We endeavor, however, to assist the purchaser every way in our power, in such instances.

**REMITTANCES.**—Remittances should be made by Bank Draft, payable to our order, or by Post Office or Express Money Order. If cash is forwarded by mail, the letter should be registered. In case goods are ordered C. O. D. a remittance sufficient to cover packing and express charges both ways should be enclosed. Express charges for collection will be added to the invoice. Remittance in full covering order is not only less expensive and more satisfactory, but expedites shipment.

**ACCOUNTS.**—We welcome responsible parties to open an account with us, but require satisfactory commercial reference before doing so. Delays in shipments will occur in case initial order is not accompanied by satisfactory reference.

**GUARANTEE.**—We guarantee our goods to be exactly as represented, and any article may be returned to us if found unsatisfactory, and will be promptly replaced or money refunded.

**All prices subject to change without notice.**





MANUFACTURING DEPARTMENT  
Pittsburgh, Pa.



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## DRAWING PAPER IN SHEETS

## WHATMAN'S HAND-MADE

The Whatman's Papers are made in three different surfaces, viz.:

H. P. signifies "Hot Pressed," and has a smooth surface; mostly used for pen and pencil drawings.

N. signifies "Cold Pressed," and has a fine grained surface; is mostly used for pencil drawing and water color painting.

R. signifies "Rough," and has a coarse grained surface; used for very bold drawing and sketching.

In ordering, state list number, size and surface wanted (H. P., N. or R.).

**110 Whatman's with H. P. or N. Surface.** Sizes marked \* also carried in Rough (R.) Surface.

		PER SHEET	PER QUIRE
Demy.....	15 x 20 inches		
Medium.....	17 x 22 inches		
Royal.....	19 x 24 inches		
Super Royal.....	19 x 27 inches		
*Imperial.....	22 x 30 inches		
*Double Elephant.....	27 x 40 inches		
Antiquarian.....	31 x 53 inches		

**111 Whatman's Extra Heavy, Selected Best.**

	PER SHEET	PER QUIRE
Imperial, 90 lbs. per ream, H. P., N. or R. 22 x 30 inches		
Imperial, 140 lbs. per ream, H. P., N. or R. 22 x 30 inches		

**112 Mounted Whatman Paper, Selected Best.**

	PER SHEET
Royal.....	19 x 24 inches
Imperial.....	22 x 30 inches
Double Elephant.....	27 x 40 inches
Antiquarian.....	31 x 53 inches

**Roslyn Water Color Paper in Rolls, C. P.**

**308** Medium Grained Surface.....66 inches wide PER 10 YDS.

Sample book will be sent on application



## DRAWING PAPERS—Continued.

## STRATHMORE DRAWING PAPER

	SIZE	11½ x 14½	14½ x 23	23 x 29
		PER 100	PER 100	PER 100
551	Medium Surface.....	1-Ply		
552	Medium Surface.....	2-Ply		
553	High Surface.....	2-Ply		
554	Medium Surface.....	3-Ply		
555	High Surface.....	3-Ply		
561	Medium Surface.....	4-Ply		
562	High Surface.....	4-Ply		
563	Medium Surface.....	5-Ply		
564	High Surface.....	5-Ply		

## OHIO DRAWING PAPER

This is a good White Paper at a low price, especially adapted for use in colleges and technical schools.

SIZES		PER QUIRE
566	15 x 20.....	
566½	18 x 24.....	
567	22 x 30.....	
568	24 x 36.....	

## ILLUSTRATION BOARD

Being "Strathmore" Medium Surface Water Color Paper, mounted on heavy board.

SIZES		PER 100
573	30 x 40 inches.....	
573A	22 x 28 inches.....	
573B	20 x 30 inches.....	
574	22 x 30 inches (Medium Weight).....	

## CHARCOAL PAPER, FRENCH, WHITE

				PER QUIRE
576	Royal	19 x 25 inches	Michallet.....	
577	Royal	19 x 25 inches	M. B. M.....	

## CHARCOAL PAPER, STRATHMORE, WHITE

			PER QUIRE
578	Royal.....	19 x 25 inches	

Sample book will be sent on application



## DRAWING PAPERS—Continued.

**"SUPERIOR" DRAWING PAPER BLOCKS**  
**FOR SKETCHING**

Our "Ohio" Paper is Used in These Blocks

Size, inches.....	5 x 7	7 x 10	9 x 12	10 x 14	14 x 20
<b>763</b> Per dozen.....					

**"PAR EXCELLENCE" SKETCH BLOCKS**

**"Whatman" Paper For Water Colors**

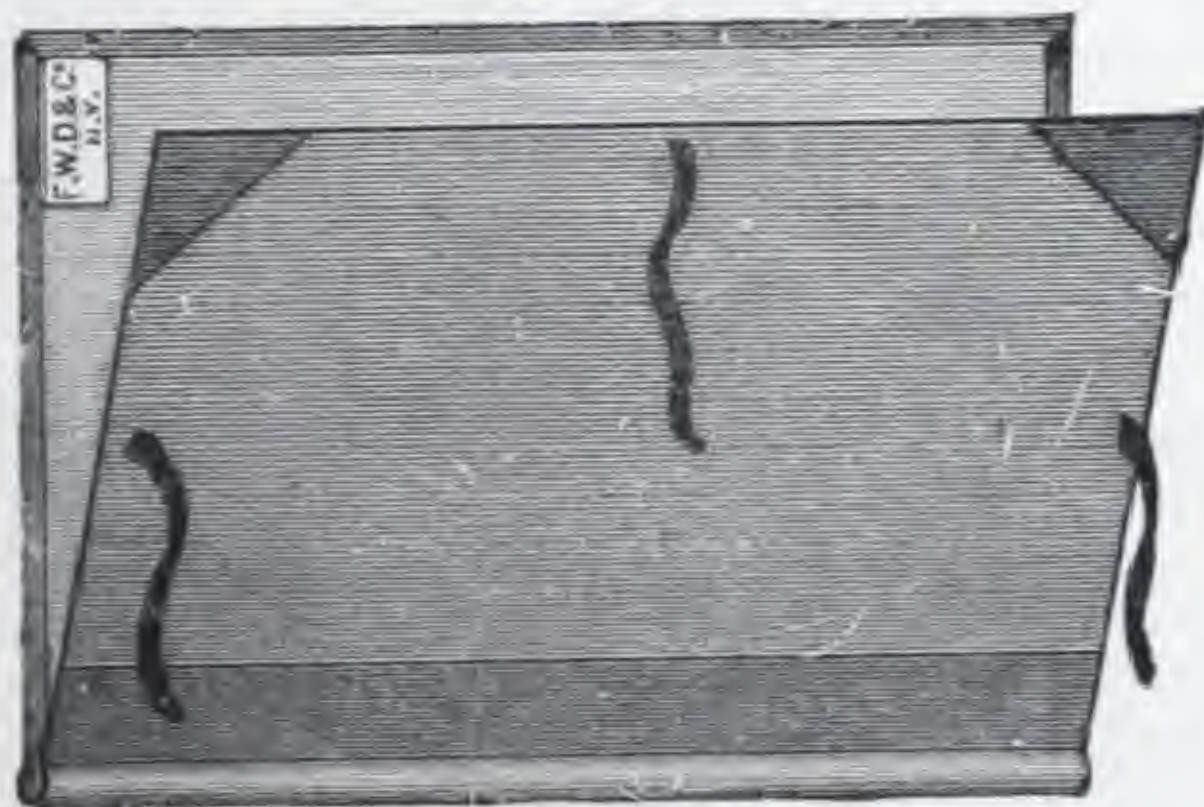
Size, inches.....	5 x 7	7 x 10	9 x 12	10 x 14	14 x 20
<b>763M</b> Per dozen.....					

**"PAR EXCELLENCE" SKETCH BLOCKS**

**"Whatman" Paper, Extra Heavy**

Size, inches.....	5 x 7	7 x 10	9 x 12	10 x 14	14 x 20
<b>763H</b> Per dozen.....					

**PORTFOLIOS**



**764**

**764** Cloth Back and Corners, Paper Sides, for school use.

Size, inches.....	11 x 16	16 x 22	19 x 25	22 x 31
Per dozen.....				

**765** Fine Leather Backs and Corners, Cloth Sides, with Flaps.

Size, inches.....	11 x 16	16 x 22	19 x 25	22 x 31
Per dozen.....				



## DRAWING PAPERS—Continued.

## BRISTOL BOARD

## 27 "Troy" Patent Office Bristol Board

PER DOZ. PER 100

10 x 15, Plain.....

10 x 15, Ruled.....

## REYNOLDS' WHITE BRISTOL BOARDS

2-PLY 3-PLY 4-PLY  
PER DOZ. PER DOZ. PER DOZ.

28 Cap..... 12½ x 15¼

29 Demy..... 14⅝ x 18¼

30 Medium..... 16½ x 20¾

31 Royal..... 18¼ x 22¾

32 Imperial..... 21½ x 28¾

## 572 "Linden Smooth" Detail Drawing Paper, Buff Color, in sheets.

PER QUIRE PER REAM

Size 22 x 30 inches.....

Size 24 x 36 inches.....

Size 27 x 40 inches.....

## 571 "Alton" Detail Drawing Paper, Buff Color, in sheets.

The Alton is a high grade paper at a medium price.

PER QUIRE PER REAM

Size 22 x 30 inches.....

Size 24 x 36 inches.....

Size 27 x 40 inches.....

## 109 "Cecil" Detail Drawing Paper, Buff Color, in sheets.

The "Cecil" is the highest grade Buff Drawing Paper made and has exceptionally good erasing qualities.

PER QUIRE PER REAM

Size 22 x 30 inches.....

Size 24 x 36 inches.....

Size 27 x 40 inches.....

WHITE DETAIL DRAWING PAPER  
IN SHEETS

## 105 "Avonmore" Detail Drawing Paper, in sheets.

PER QUIRE PER REAM

Size 22 x 30 inches.....

Size 24 x 36 inches.....

Size 27 x 40 inches.....

Sample book will be sent on application



## DRAWING PAPERS—Continued



102



103



108

(Reduced facsimiles of our labels)

**102 "Alton" Detail Drawing Paper.**

This Buff paper has unexcelled erasing qualities for a medium priced paper. A trial will convince you.

PER LB.

Original rolls, 30 to 40 lbs. each.....

50 Yds. 10 Yds. PER Yd.

30 inches wide.....

36 inches wide.....

42 inches wide.....

48 inches wide.....

No. 571 is the same paper in sheets.

**103 "Linden Smooth" Detail Drawing Paper.**

This paper is of buff tint and has a fine grained surface, and is well suited for fine mechanical drawings. It is of domestic manufacture.

PER LB.

Original rolls, 30 to 40 lbs.....

50 Yds. 10 Yds. PER Yd.

30 inches wide.....

36 inches wide.....

42 inches wide.....

54 inches wide.....

No. 572 is the same paper in sheets.

**108 "Cecil" Detail Drawing Paper.**

We believe this to be the best buff detail drawing paper on the market. It erases perfectly and takes ink, pencil and color well.

PER LB.

Original rolls, 30 to 40 lbs.....

50 Yds. 10 Yds. PER Yd.

30 inches wide.....

36 inches wide.....

42 inches wide.....

60 inches wide.....

This paper is also carried mounted on muslin.

No. 109 is the same paper in sheets.

Sample book will be sent on application



## DRAWING PAPERS—Continued

## "ORCHID" DETAIL PAPERS

Possess splendid erasing qualities for a manila paper and takes India ink and water color.

## 170 Thin Weight.

Original rolls, about 125 lbs. each. . . . . PER LB.

100 Yds. 50 Yds. 20 Yds.  
 30 inches wide. . . . .  
 36 inches wide. . . . .  
 42 inches wide. . . . .  
 48 inches wide. . . . .

## 180 Medium Weight.

Original rolls, about 125 lbs. each. . . . . PER LB.

100 Yds. 50 Yds. 20 Yds.  
 30 inches wide. . . . .  
 36 inches wide. . . . .  
 42 inches wide. . . . .  
 48 inches wide. . . . .

## 200 Heavy Weight.

Original rolls, about 125 lbs. each. . . . . PER LB.

100 Yds. 50 Yds. 20 Yds.  
 30 inches wide. . . . .  
 36 inches wide. . . . .  
 42 inches wide. . . . .  
 48 inches wide. . . . .

## "BRAZILIAN" DETAIL PAPERS

These are of light buff color and possess splendid erasing qualities for such a low priced paper. It is carried in three weights.

## 170B Thin Weight.

Original rolls, about 125 lbs. each. . . . . PER LB.

100 Yds. 50 Yds. 20 Yds.  
 30 inches wide. . . . .  
 36 inches wide. . . . .  
 42 inches wide. . . . .  
 48 inches wide. . . . .

## 180B Medium Weight.


Original rolls, about 125 lbs. each. . . . . PER LB.

100 Yds. 50 Yds. 20 Yds.  
 30 inches wide. . . . .  
 36 inches wide. . . . .  
 42 inches wide. . . . .  
 48 inches wide. . . . .

Sample book will be sent on application



## NOTICE!

 WING to frequent changes in market prices, it is considered inadvisable by us to show fixed list prices in this catalogue, consequently

### YOU WILL FIND

the Price List in the pocket attached to the inside of the Back Cover

### AFTER USING

the Price List it should be replaced in pocket to prevent its being mislaid.

In case of general changes in prices occurring later, a new Price List will be mailed you to replace the one now in pocket of Back Cover.

Respectfully,

**B. K. ELLIOTT COMPANY**



# NOTICE!

BEING in frequent change in market prices it is considered imperative to advise us to show that prices in this catalogue correspond.



## YOU WILL FIND

the Price List in the pocket attached to the inside of the Book Cover

## AFTER USING

the Price List it should be returned to pocket to prevent the book mislaid.

In case of general change in prices occurring later, a new Price List will be mailed you to replace the one now in pocket of Book Cover.

Respectfully,

B. A. ELLIOTT COMPANY



## DRAWING PAPERS—Continued.

## "BRAZILIAN" PAPERS—Continued

## 200B Heavy Weight.

PER LB.

Original rolls about 125 lbs. each.....

100 Yds. 50 Yds. 20 Yds.

30 inches wide.....

36 inches wide.....

42 inches wide.....

48 inches wide.....

## WHITE DRAWING PAPERS



545



550



565

(Reduced facsimiles of our labels)

## "DURANA" TWO WEIGHTS

Very strong and pliable, with slightly grained surface. This is a splendid paper for use where drawings require much handling.

## 550 Medium Weight.

PER LB.

Original rolls, about 40 lbs.....

10-yard rolls, 72 inches wide.....

## 555 Heavy Weight.

PER LB.

Original rolls, about 40 lbs.....

10 Yds. PER Yd.

36 inches wide.....

60 inches wide.....

72 inches wide.....

## 545 "Avonmore" White Drawing Paper.

This paper is white and has a fine grained surface, and is well suited for fine mechanical drawings. It is of domestic manufacture.

PER LB.

Original rolls 30 to 40 lbs. each.....

50 Yds. 10 Yds. PER Yd.

30 inches wide.....

36 inches wide.....

42 inches wide.....

48 inches wide.....

Sample book will be sent on application



## DRAWING PAPERS—Continued.

## “LENOX” WHITE DRAWING PAPERS

These are the finest continuous roll drawing papers made, as they are manufactured from the best selected stock with utmost care. The Rough (or Eggshell) Surface Papers are especially desirable for maps, finished drawings or water-color sketches. The Smooth Surface Papers are especially suitable for pen and ink drawings, sketches, or work to be photographed. They will retain their pliability indefinitely, and the erasing qualities are unsurpassed.

<b>565 Smooth Medium.</b>	PER LB.
Original rolls, 30 to 40 pounds each.....	\$
10 YDS.	PER YD.
36 inches wide.....	
42 inches wide.....	
58 inches wide.....	

<b>575 Smooth Thick.</b>	PER LB.
Original rolls, 30 to 40 pounds, each.....	\$
10 YDS.	PER YD.
36 inches wide.....	
42 inches wide.....	
58 inches wide.....	

<b>585 Rough Medium (Eggshell)</b>	PER LB.
Original rolls, 30 to 40 pounds, each.....	\$
10 YDS.	PER YD.
36 inches wide.....	
42 inches wide.....	
58 inches wide.....	

<b>595 Rough Heavy (Eggshell)</b>	PER LB.
Original rolls, 30 to 40 pounds each.....	\$
10 YDS.	PER YD.
36 inches wide.....	
42 inches wide.....	
58 inches wide.....	

MOUNTED DRAWING PAPERS  
(ON MUSLIN)

<b>208 Cecil (Buff), Mounted.</b>	10 YDS.
30 inches wide.....	
36 inches wide.....	
42 inches wide.....	
60 inches wide.....	

<b>153 Linden Smooth (Buff), Mounted.</b>	10 YDS.
36 inches wide.....	
42 inches wide.....	
54 inches wide.....	

Sample book will be sent on application



## DRAWING PAPERS—Continued.

## MOUNTED DRAWING PAPERS

## 645 Avonmore, Mounted.

10 YDS.

PER YD.

36 inches wide .....  
 42 inches wide .....  
 48 inches wide .....

## 665 Lenox Smooth Medium, Mounted.

10 YDS.

PER YD.

36 inches wide .....  
 42 inches wide .....  
 58 inches wide .....

## 675 Lenox Smooth Thick, Mounted.

10 YDS.

PER YD.

36 inches wide .....  
 42 inches wide .....  
 58 inches wide .....

## 685 Lenox Rough Medium, Mounted.

10 YDS.

PER YD.

36 inches wide .....  
 42 inches wide .....  
 58 inches wide .....

## 695 Lenox Rough Thick, Mounted.

10 YDS.

PER YD.

36 inches wide .....  
 42 inches wide .....  
 58 inches wide .....

## 650 Durana Medium, Mounted.

10 YDS.

PER YD.

72 inches wide .....

## 655 Durana Heavy, Mounted.

10 YDS.

PER YD.

72 inches wide .....

Nos. 153, 645, 665, 675, 685, 695, 650, 655, 208 are Nos. 103, 545, 565, 575, 585, 595, 550, 555 and 108 mounted on muslin.

Price will be quoted on application for sheets of above papers of any size, mounted on muslin.

Sample book will be sent on application



## TRACING CLOTHS



## "LENOX" TRACING CLOTH

478 "Lenox" Tracing Cloth, one side glazed, the other side dull. PER ROLL

30 inches wide, 24-yard rolls. ....  
 36 inches wide, 24-yard rolls. ....  
 42 inches wide, 24-yard rolls. ....



## "IMPERIAL" TRACING CLOTH

476 "Imperial" Tracing Cloth, one side glazed, the other side dull. PER ROLL

30 inches wide, 24-yard rolls. ....  
 36 inches wide, 24-yard rolls. ....  
 38 inches wide, 24-yard rolls. ....  
 41 inches wide, 24-yard rolls. ....  
 48 inches wide, 24-yard rolls. ....  
 54 inches wide, 24-yard rolls. ....

<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <b>PITTSBURGH CAR CO.</b>  <b>PITTSBURGH, PA.</b> </div>		
<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">SUPERINTENDENT</div>	<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">DRAWN</div>	<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">SCALE</div>
<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">CHECKED</div>	<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">DATE</div>	<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">SUPERSEDING</div>
<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">APPROVED</div>	<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">ASSEMBLY</div>	<div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">DRAWING</div>

Tracing Cloth Sheets of any size, cut and printed with title and borders with our special prepared black ink, which is guaranteed to be opaque and will not rub off. You will find it economical, both in time and material, to have your Tracing Cloth Sheets printed.

State quantity desired and dimension of sheets when sending sample for quotation.

477 Tracing Cloth Ink, Black, in 1-pound cans, PER LB.

Sample book will be sent on application



## TRACING CLOTH—Continued.

## PENCIL CLOTH

- 479 **Pencil Tracing Cloth** one side glazed, the other side dull. This is a strong white cloth of moderate transparency and very suitable for pencil tracings.

PER ROLL

30 inches wide, 24-yard rolls.....  
 38 inches wide, 24-yard rolls.....

- 480 **"Highland" Drawing Cloth.**

This fabric is intended to fulfill a demand for a material for permanent drawings.

10-YD. ROLLS

30 inches wide.....  
 36 inches wide.....  
 42 inches wide.....

## TRACING PAPERS IN ROLLS



482



500



485

(Reduced facsimiles of labels)

- 481 **Teutonia.** Canary color, for tracing details. Very thin. PER ROLL  
 48 inches wide, 100-yard rolls.....  
 40 inches wide, 100-yard rolls.....
- 482 **Unglazed Natural.** White, very transparent and strong. PER ROLL  
 57 inches wide, 20-yard rolls.....  
 57 inches wide, 50-yard rolls.....  
 42 inches wide, 20-yard rolls.....  
 42 inches wide, 50-yard rolls.....
- 483 **Royal, Thin.** Glazed parchment, very transparent and strong. PER ROLL  
 43 inches wide, 22-yard rolls.....
- 484 **Othello, Thin.** Glazed, very transparent PER ROLL  
 43 inches wide, 20-yard rolls.....
- 485 **Othello, Medium.** Glazed, transparent. PER ROLL  
 43 inches wide, 20-yard rolls.....

Sample book will be sent on application



## TRACING PAPERS—Continued.

- 486 **Onion Skin.** Glazed and very transparent. PER ROLL  
 36 inches wide, 20-yard rolls.  
 42 inches wide, 20-yard rolls.

- 487 **Elliott Bond.** A very strong white paper with a smooth drawing surface. PER ROLL  
 36 inches wide, 20-yard rolls.  
 36 inches wide, 50-yard rolls.  
 42 inches wide, 20-yard rolls.  
 42 inches wide, 50-yard rolls.

- 488 **Elliott Thin Bond.** An excellent, thin, transparent, unglazed, white tracing paper. Very strong and stands erasing well. PER ROLL  
 36 inches wide, 25-yard rolls.  
 36 inches wide, 50-yard rolls.  
 42 inches wide, 25-yard rolls.  
 42 inches wide, 50-yard rolls.

- 500 **Vellum.** Prepared, very strong and transparent. Takes ink, crayon and water colors, and will not buckle. A good substitute for tracing cloth. PER ROLL  
 30 inches wide, 20-yard rolls.  
 36 inches wide, 20-yard rolls.  
 42 inches wide, 20-yard rolls.  
 This paper can be furnished in pasteboard tubes at an additional cost.

- 501 **Federal.** White, very strong and transparent. Especially adapted for drawings considerably handled. PER ROLL

- 30 inches wide, 20-yard rolls.  
 36 inches wide, 20-yard rolls.  
 42 inches wide, 20-yard rolls.  
 30 inches wide, 50-yard rolls.  
 36 inches wide, 50-yard rolls.  
 42 inches wide, 50-yard rolls.

- 502 **Standard Medium.** White, for sketching and drawing. Blue Prints can be made very readily from drawings made on this paper.

- 10-Yd. ROLLS 50-Yd. ROLLS 100-Yd. ROLLS  
 30 inches wide  
 36 inches wide  
 60 inches wide

Sample book will be sent on application



## INK ERADICATOR AND POUNCE



800

## ELECTRIC INK ERADICATOR

Guaranteed to remove waterproof India ink from tracing cloth without disturbing the surface.

800	2-ounce bottle .....
800A	8-ounce bottle .....
800B	16-ounce bottle .....
800C	32-ounce bottle .....

## POUNCE FOR TRACING CLOTH

801	Pounce for Tracing Cloth.	EACH
	In tin shakers .....	\$

When tracing cloth will not take the ink readily, apply a small quantity of the Pounce and distribute over surface of the cloth by rubbing with a piece of chamois, waste or similar material, and then remove same before applying the ink.



801



802B

## ELECTRIC TRANSPARENTIZING SOLUTION

This solution applied to soiled or old tracings restores their transparency. If applied to brown negatives or drawings on white paper, it greatly increases their transparency.

		PER GAL.
802	Electric Transparentizing Solution...	
		PER 1/2 GAL.
802A	Electric Transparentizing Solution...	
		PER QT.
802B	Electric Transparentizing Solution...	



## BLUE PRINTING DEPARTMENT

**B**OTH in Pittsburgh and Cleveland we operate large plants for the making of **Blue Prints, Brown Prints, Black Prints, etc.**, on paper or cloth, from customer's tracings.

As we have installed the very latest **Continuous Electric Printing, Washing and Drying Apparatus**, we are able to execute any size order for printing in the shortest possible time.

We endeavor at all times to secure the best possible prints from each customer's tracings, according to their condition, and we use only the best material in making the prints.

Prints up to 54 inches wide, of any length, made in one continuous sheet, and when desired can be furnished "mounted on muslin."

As we insure the tracings and prints of out-of-town customers when returning them by parcels post or express, our customers should insure them at their proper value when sending them to us, so in case of loss or damage, the customer is adequately protected.

## PHOTOSTAT PRINTING DEPARTMENT

In Pittsburgh we operate a department for the production of first quality **Photostat Prints**, and are prepared to furnish prints of any desired scale up to 18 x 22 inches. Prints larger than 18 x 22 inches can be furnished in sections.

We also reduce or enlarge Drawings, Maps, Letters, Insurance Policies, Pages of Books, etc.

Prices will be submitted on application.

**Prices and Samples showing our work, furnished on request**





## BLUE PRINT PAPERS

Our high-grade Blue Print Papers have acquired a splendid reputation, especially among large users, as regards superior strength, printing properties and sharpness of lines. This reputation we are maintaining, as we use nothing but the best raw stock and pure chemicals, and our solutions are applied in the most scientific manner after receipt of each order by our improved coating machines.

"SUPERB" Papers are all rag, and chemically pure, and when sensitized by us will be found of unexcelled printing and keeping qualities.

"PENN" Papers are high-grade stock, and are produced by us to meet a demand for a medium-priced paper for general use, which possesses good strength and excellent printing properties. This paper is equal to many "supposed" first quality papers.

"FULTON" Papers are produced by us to meet a demand for a low-priced paper for shop use, and possess good strength and excellent printing properties.

## SENSITIZING SOLUTIONS

"EXTRA RAPID" indicates a solution specially intended for use with electric printing machines of any type. It requires an exposure of about twenty to thirty seconds in bright, summer sunlight. During summer months not more than three to four weeks' supply should be ordered.

"WUNMINIT" indicates a rapid printing paper which requires an exposure of about one to one and one-half minutes in bright, winter sunlight and thirty to forty seconds in bright, summer sunlight. It is a splendid keeping paper, and produces a sharp, white line on a deep blue background.

"RAPID" indicates a solution with printing speed a little slower than the "WUNMINIT" solution, and meets the requirements of those desiring a deep blue background.

"REGULAR" indicates the old-style, slow-printing solution, with the improvements effected by us.

In ordering Sensitized Blue Print Papers, please be careful to indicate whether "EXTRA RAPID," "WUNMINIT" "RAPID" or "REGULAR" solution is desired

Sample book will be sent on application



## SENSITIZED BLUE PRINT PAPERS AND CLOTHS

	INCHES	24	27	30	36	42	54
<b>2F</b>	<b>Fulton, Thin Parchment.</b>						
	Per roll of 10 yards. . . .						
	Per roll of 50 yards. . . .						
<b>4F</b>	<b>Fulton, Satin, Medium Thick.</b>						
	Per roll of 10 yards. . . .						
	Per roll of 50 yards. . . .						
<b>6F</b>	<b>Fulton, Satin, Thick.</b>						
	Per roll of 10 yards. . . .						
	Per roll of 50 yards. . . .						
<b>2</b>	<b>Penn, Thin Parchment.</b>						
	Per roll of 10 yards. . . .						
	Per roll of 50 yards. . . .						
<b>4</b>	<b>Penn, Satin, Medium Thick.</b>						
	Per roll of 10 yards. . . .						
	Per roll of 50 yards. . . .						
<b>6</b>	<b>Penn, Satin, Thick.</b>						
	Per roll of 10 yards. . . .						
	Per roll of 50 yards. . . .						
<b>20</b>	<b>Superb, Thin Parchment.</b>						
	Per roll of 10 yards. . . .						
	Per roll of 50 yards. . . .						
<b>50</b>	<b>Superb, Satin, Medium Thick.</b>						
	Per roll of 10 yards. . . .						
	Per roll of 50 yards. . . .						
<b>90</b>	<b>Victor Blue Print Cloth, Medium.</b>						
	Per roll of 10 yards. . . . .						
	Per roll of 50 yards. . . . .						
<b>90½</b>	<b>Victor Blue Print Cloth, Thin.</b>						
	Per roll of 10 yards. . . . .						
	Per roll of 50 yards. . . . .						

Any of the above papers can be furnished in **100 yard continuous rolls**, if desired.

Sheets of Any Size Cut to Order

Sample book will be sent on application



## UNPREPARED BLUE PRINT PAPERS

	INCHES	24	27	30	36	42	54
<b>3F</b>	<b>Fulton, Thin Parchment.</b>						
	Per roll of 50 yards.....						
<b>5F</b>	<b>Fulton, Satin, Medium Thick.</b>						
	Per roll of 50 yards.....						
<b>7F</b>	<b>Fulton, Satin, Thick.</b>						
	Per roll of 50 yards.....						
<b>3</b>	<b>Penn, Thin Parchment.</b>						
	Per roll of 50 yards.....						
<b>5</b>	<b>Penn, Satin, Medium Thick.</b>						
	Per roll of 50 yards.....						
<b>7</b>	<b>Penn, Satin, Thick.</b>						
	Per roll of 50 yards.....						
<b>21</b>	<b>Superb, Thin Parchment.</b>						
	Per roll of 50 yards.....						
<b>51</b>	<b>Superb, Satin, Medium Thick.</b>						
	Per roll of 50 yards.....						
<b>91</b>	<b>Victor Blue Print Cloth, Medium Weight.</b>						
	Per roll of 10 yards.....						
<b>91½</b>	<b>Victor Blue Print Cloth, Thin Weight.</b>						
	Per roll of 10 yards.....						

Sample books furnished on application



Illustration full size

## ERASING FLUID

- 99W** Electric "White" Erasing Fluid.  
For making alterations on blue prints.  
Per bottle.....
- 99R** Electric "Red" Erasing Fluid.  
For marking or tinting blue prints.  
Per bottle.....
- 99Y** Electric "Yellow" Erasing Fluid.  
For marking or tinting blue prints.  
Per bottle.....



### "ELECTRIC" BROWN PRINT PAPER

This paper is the most satisfactory on the market for producing brown prints or negatives. Positive prints (either blue line or brown line on white background) are easily made from negatives made on the "Electric" Brown Print Paper.

It is easily manipulated.  
It is a good keeping paper.  
It does not become brittle with age.  
It prints rapidly.  
It preserves original tracing.

### DIRECTIONS FOR USE

Place the tracing in the blue print frame over sheet of thin brown print paper and expose until the outer edges of paper assume a dark yellow appearance. Then place print in water bath, allowing to remain for a period of four or five minutes, then paint it with fixing solution described below and again immerse print. If exposure has been sufficient, the result will be a white transparent line on an opaque brown background. This is the negative. The positive copies may be made by placing negative over a sheet of the brown print paper or cloth, exposing sufficiently to the light, and then placing positive print in the water, allowing it to remain for a period of four or five minutes, then paint it with fixing solution, and again immerse it in water. If exposure has been sufficient, the result will be a dark brown line on a pure white ground.

By placing the negative over a sheet of our Sensitized Blue Print Paper and exposing to the light for the proper length of time and then immerse in clear water, the result will be a blue line on a pure white ground.



### ELECTRIC BROWN ERASING FLUID

FOR USE ON BROWN PRINTS  
803B

This fluid produces white lines on "brown" prints and takes brown lines or spots off "brown line" prints.

Per bottle.....

803B  
Illustration Full Size



## SENSITIZED BROWN PRINT PAPER AND CLOTHS

FOR POSITIVE AND NEGATIVE PRINTS



450



451



453

## 450 Electric Brown Print Paper, Medium Thick.

	WIDTH, INCHES			
	30	36	42	54
Per roll of 10 yards.....				
Per roll of 50 yards.....				

## 451 Electric Brown Print Paper, Thin for Negatives.

Per roll of 10 yards.....	
Per roll of 50 yards.....	

## 452 Electric Brown Print Cloth, Medium.

Per roll of 10 yards.....	
---------------------------	--

## 453 Electric Brown Print Cloth, Thin.

Per roll of 10 yards.....	
---------------------------	--

## FIXING SOLUTION

The fixing Solution is made by dissolving a tablespoonful of hyposulphite of sodium in a quart of water, and the same is applied by means of a sponge or soft brush. A sufficient amount for developing accompanies each roll of Electric Brown Print Paper or Cloth.

Samples will be sent on application



## TUBES FOR PRESERVING PAPER



804B

Made of best tin, with tight fitting cap; for keeping broken rolls of blue print paper and brown print paper from light and moisture. Can also be used for filing drawings.

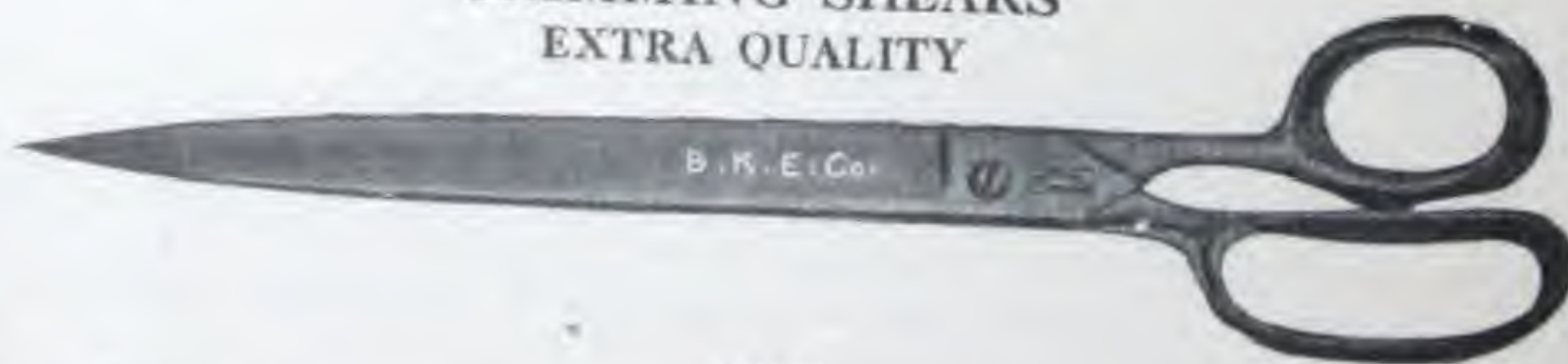
	LENGTH IN INCHES	DIAMETER IN INCHES	EACH
804	24	2 1/2	
804A	31	2 1/2	
804B	37	2 1/2	
804C	43	2 1/2	
804D	55	2 1/2	
804E	24	3 1/2	
804F	31	3 1/2	
804G	37	3 1/2	
804H	43	3 1/2	
804I	55	3 1/2	
804J	24	5	
804K	31	5	
804L	37	5	
804M	43	5	
804N	55	5	

Quotations made on special sizes upon application.  
 Pasteboard tubes carried in stock.  
 Prices quoted upon application.



805 Clothes Pins. For hanging blue prints while drying.  
 Per dozen.....

TRIMMING SHEARS  
 EXTRA QUALITY



	806C	EACH
806	Trimming Shears, extreme length 8 inches.....	
806A	Trimming Shears, extreme length 10 inches.....	
806B	Trimming Shears, extreme length 12 inches.....	
806C	Trimming Shears, extreme length 14 inches.....	

These Shears are especially adapted for trimming blue prints, drawings, tracings, etc.; made of high grade material, with long, thin blades of perfect temper and true cutting edges.



## IMPROVED BLUE PRINT FRAMES



807B

Our blue print frames are made from well seasoned material, with oak frame, pine backs, dovetailed corners, secured by iron corner plates. Finish, three coats golden oak, black backs. Oil tempered springs.

		FRAMES ONLY	DOUBLE THICK GLASS	POLISHED PLATE GLASS AND PAD
807	20x26.....			
807A	24x30.....			
807B	30x42.....			
807C	36x48.....			
807D	36x60.....			
807E	42x60.....			

## BATH TRAYS



808B

## BATH TRAY, GALVANIZED IRON, WIRE RIM

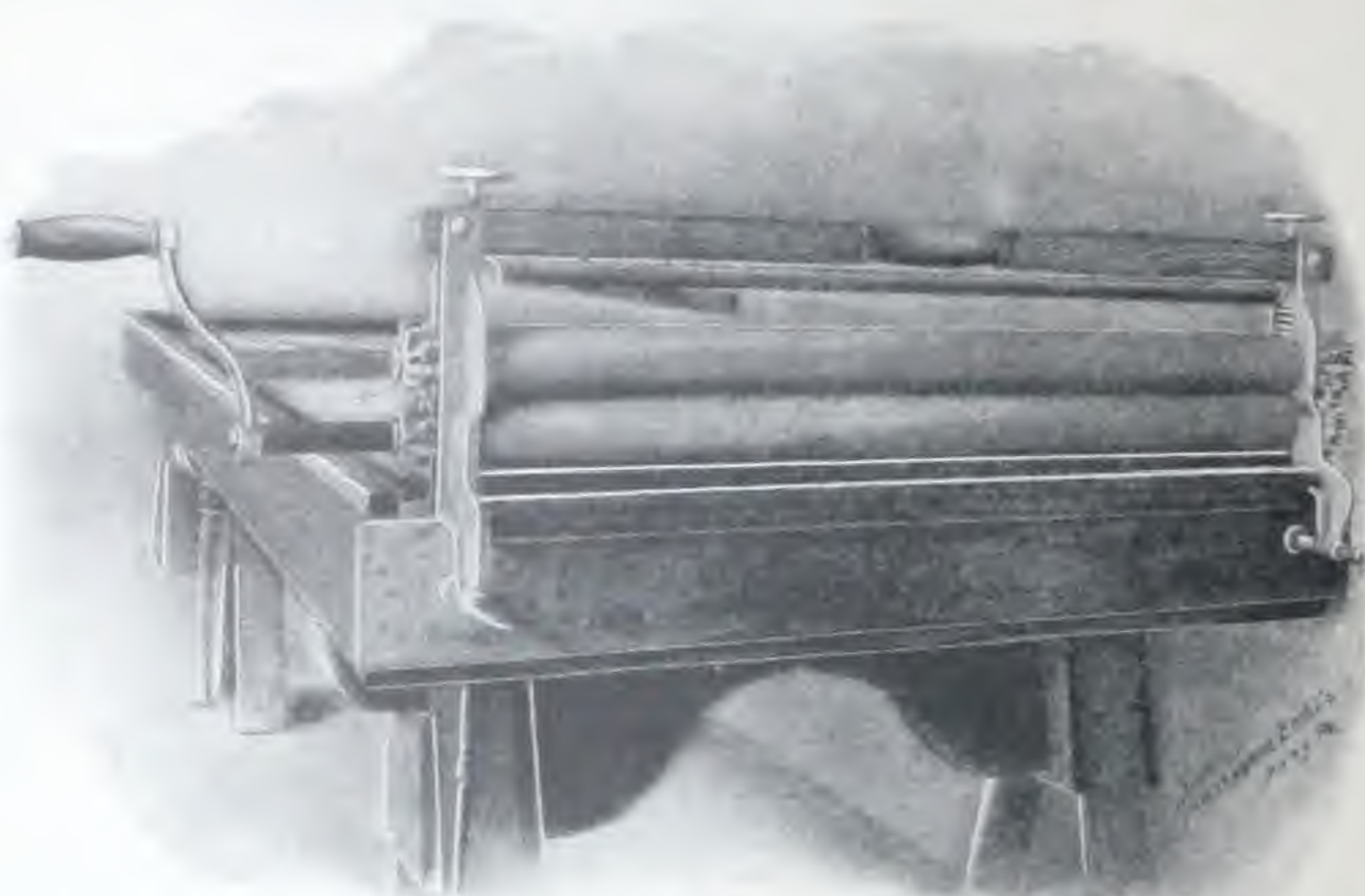
	SIZE	PRICE
808	20 x 24.....	
808A	24 x 30.....	
808B	30 x 42.....	
808C	36 x 60.....	
808D	42 x 60.....	

Quotation on special sizes upon application.



## BLUE PRINT WRINGERS

Rolls made of the best rubber obtainable, each being  
3 inches in diameter



816G

Our Blue Print Wringers are for use in Blue Print Rooms where a large number of prints are made daily, and with the use of same, prints are dried in one-fourth ( $\frac{1}{4}$ ) the time formerly required. It is attached to the end of bath tray, as shown in illustration above, and the water drains back into tray. It is provided with an idler placed slightly below the top of the lower rubber roll, and this idler supports the wet print as it goes between the rubber rolls, taking out the sag in the wet print, thus preventing wrinkling.

### Blue Print Wringer

No.	SIZE	EACH	No.	SIZE	EACH
816	24-inch.....		816D	38-inch.....	
816A	30-inch.....		816E	42-inch.....	
816B	34-inch.....		816F	44-inch.....	
816C	36-inch.....		816G	48-inch.....	

We guarantee rubber rolls of wringer to be made of first quality rubber.



## VERTICAL ELECTRIC BLUE PRINTING MACHINE

## GENERAL DESCRIPTION:

This Vertical Blue Printing Machine consists of two half-cylinders of glass held in place by a frame entirely of metal. It is self-contained, no part being attached to wall or ceiling; it can therefore be placed at any convenient point, and can be moved from one part of the room to another at will. The floor space required is only three feet square. Every machine carries the manufacturer's guarantee of satisfaction and service.

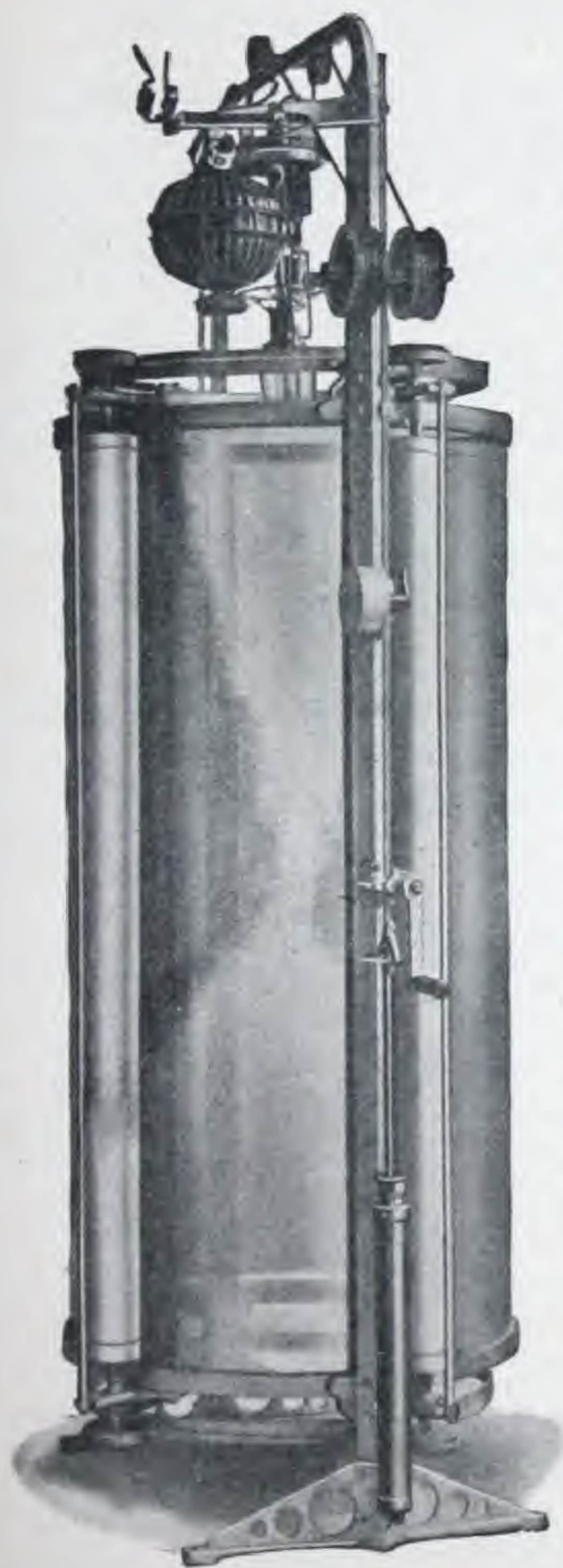
## FULL CYLINDER MACHINES

SIZE	FLOOR SPACE	HEIGHT
32 x 42 in.	26 x 42 in.	7 ft.
42 x 42 in.	32 x 49 in.	7 ft.
36 x 60 in.	28 x 45 in.	8 ft. 6 in.
42 x 60 in.	32 x 49 in.	8 ft. 6 in.
42 x 72 in.	32 x 49 in.	9 ft. 6 in.

## HALF CYLINDER MACHINES

SIZE	FLOOR SPACE	HEIGHT
32 x 42 in.	26 x 42 in.	7 ft.
42 x 42 in.	32 x 49 in.	7 ft.
36 x 60 in.	28 x 45 in.	8 ft. 6 in.
42 x 60 in.	32 x 49 in.	8 ft. 6 in.
42 x 72 in.	32 x 49 in.	9 ft.

In ordering state kind of current and voltage. If for A. C. also give frequency of cycle.





## BLUE STREAK PRINTER

The Blue Streak machine, as its name implies, is built for speed. It also assures positive contact.

The paper, with the tracing right side up on top, is fed across a convenient table into the machine, where it passes to the surface of the revolving glass cylinder, the tracings to be printed lying between the cylinder and the paper as the cylinder revolves through half a revolution. They then leave the cylinder and drop into a chute in front of the operator, below the feeding table.

If the printing is being done from continuous rolls, the roll is automatically wound up again as it is printed, or it may be arranged to deliver the paper direct to a continuous washer and drier, the tracings remaining in the chute, which is placed at the front of the machine.

The light is supplied by high power arc lamps made specially for this kind of work, which hang outside of the cylinder at the back of the machine, and can be furnished to operate on any current supply.

In all arc lamp work, high voltage direct current is superior for printing to any other. Each lamp operates on a separate switch, so that one or more may be thrown in as the width of the print may require.

Style No. 1 is the printing machine only.

Style No. 2 is the combined printer, washer and dryer.

Style No. 1	Description	
Model	45	60
Printing width maximum	45"	60"
Mechanical speed maximum/min.	25'	25'
Mechanical speed minimum/min.	1"	1"
Arc lamp equipment	4	6
Lamp carbon length	16"	16"
Motor H. P.	$\frac{1}{4}$	$\frac{1}{4}$
Machine width	3'2"	3'2"
Machine length	5'1 $\frac{1}{2}$ "	6'8 $\frac{1}{2}$ "
Machine height	5'3"	5'3"
Weight net	800 lbs.	950 lbs.
Weight shipping domestic	1210 lbs.	1500 lbs.



## REVOLUTE

## CONTINUOUS—TYPE No. 2 C

## BLUE STREAK PRINTER, WASHER AND DRYER

CONTACT in printing is necessary

Positive CONTACT is "REVOLUTE"

"Revolute" rotary positive **contact** is obtained by using a revolving glass **cylinder** which **rotates** with the **contact** belts, tracing and paper during printing process.

**Rotary Positive Contact Continuous** Printer, Washer and Drier will turn out **finished prints** from cloth or paper originals on cloth or paper in continuous rolls.

The **printer** will reproduce the finest details of original without slippage, due to **rotary positive contact**.

The **washer and drier** is a **straight line machine** and prints go straight **through**. Practically no side travel.

The Continuous Machine is completely equipped with ball-bearing rollers, reducing friction to a minimum.

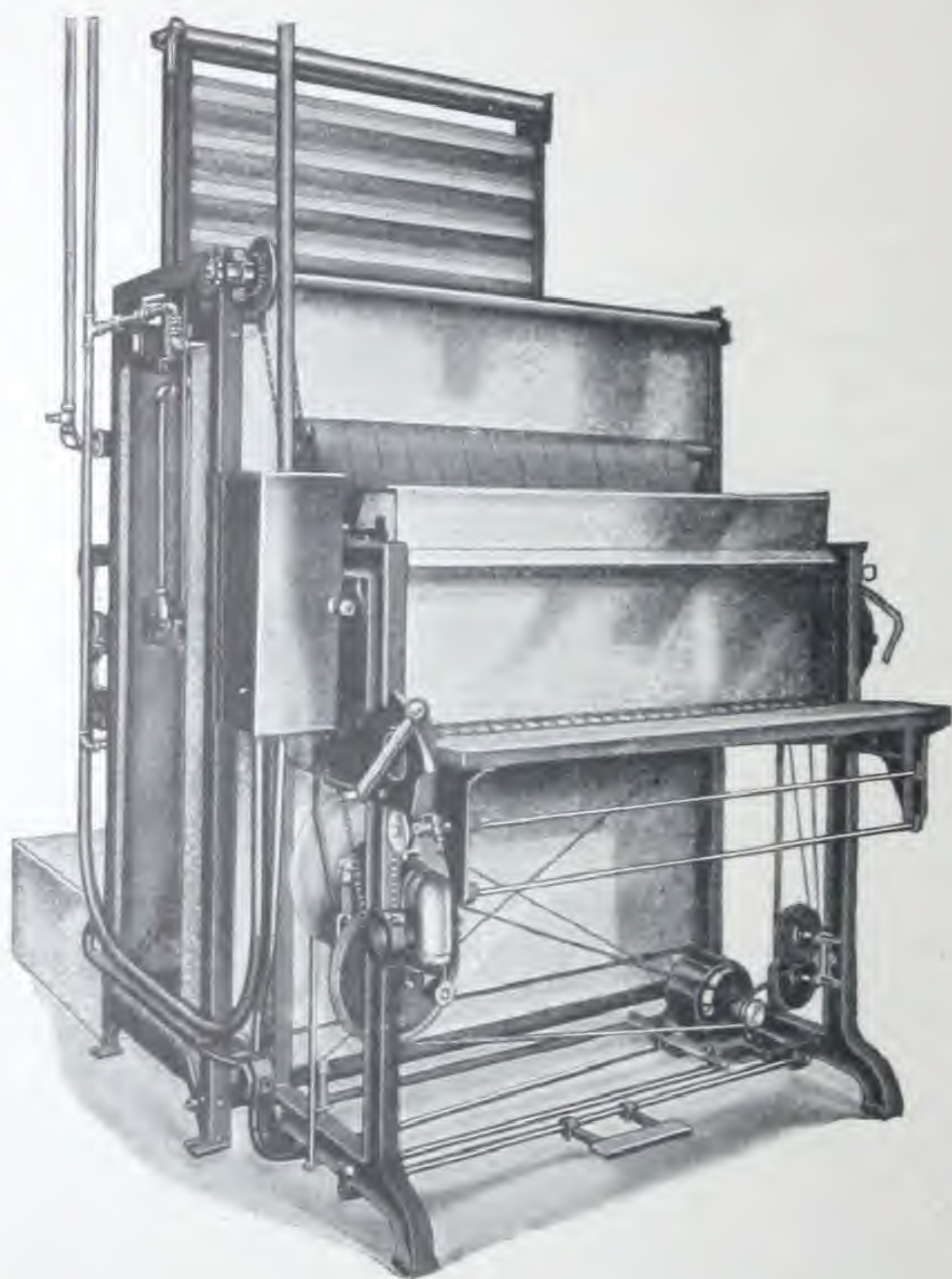
All machines can be equipped regularly with electrical equipment for 220 D. C., 220 A. C., 110 D. C., 110 A. C.—60 cycle is standard A. C. equipment. Either gas or electric drying. Special equipment for lower cycle current or for other voltages can be supplied.

Full information will be furnished upon request. Kindly state required capacity in square feet of prints per day, maximum width of print required and specifications of electric current available.

Model	44	59
Printing Width	44"	59"
Mechanical Speed—Max./Min.	12'—0"	12'—0"
Mechanical Speed—Min./Min.	0'—2"	0'—2"
Machine Width	4'—11 1/4"	6'—2 1/4"
Machine Length	6'—1"	6'—1"
Machine Height	8'—0"	8'—0"
Number of Arc Lamps	5	7
Motor Equipment	2	2
Length First Water Wash	6'—0"	6'—0"
Length Fixing Solution Wash	2'—6"	2'—6"
Length Final Water Wash	1'—8"	1'—8"
Length Total Wash	10'—2"	10'—2"
Length Total Drying	7'—4"	7'—4"
Total Fixing Tank Volume	35.1 Gal.	45.5 Gal.
Volume Potash Solution	20.7 Gal.	26.9 Gal.
Volume Soda Solution	11.3 Gal.	15.5 Gal.



REVOLUTE CONTINUOUS  
BLUE PRINTING MACHINERY



PATENTED

June 9th and Sept. 22nd, 1903

March 31st, 1908

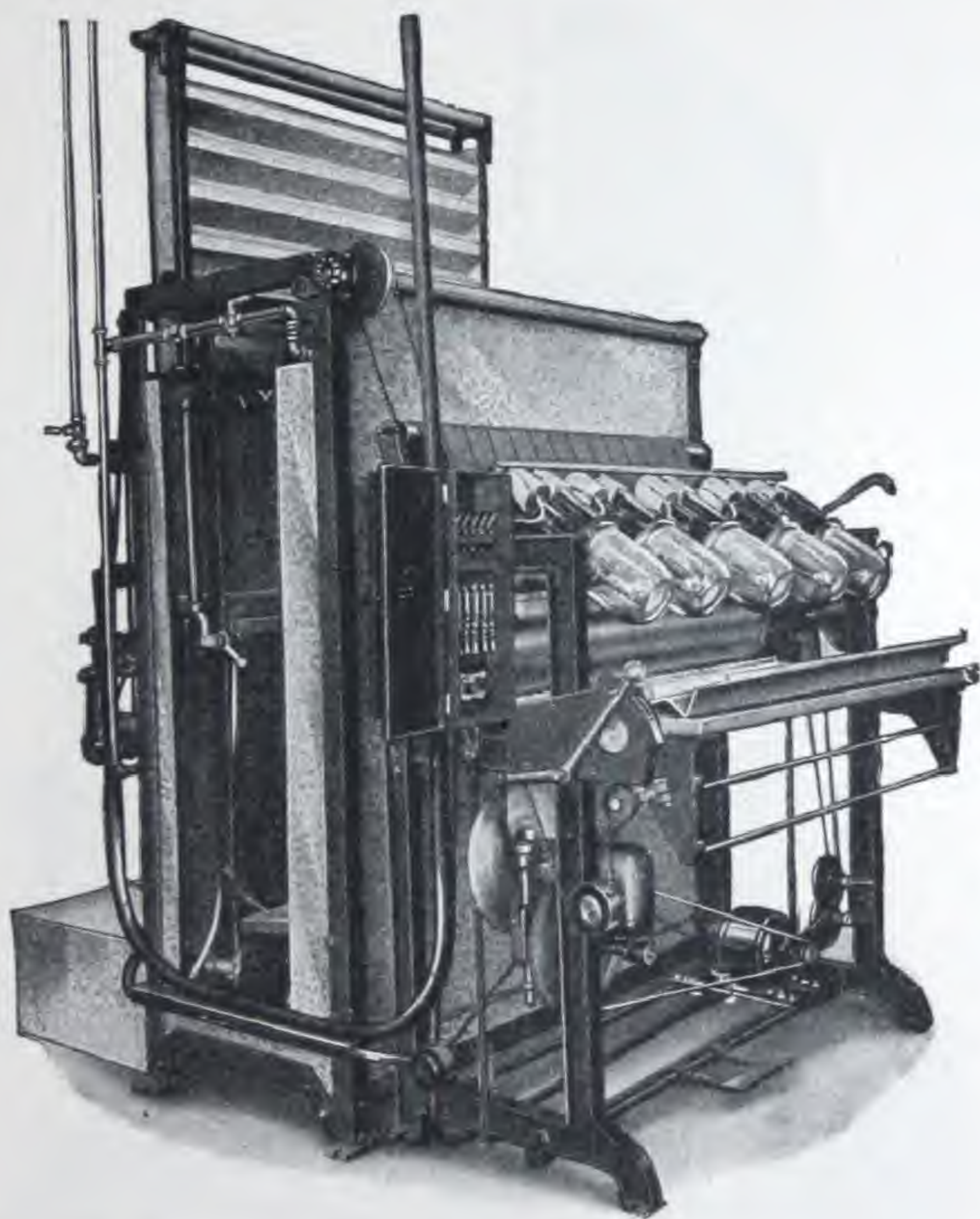
Aug. 6th, 1912

Others Pending



REVOLUTE  
CONTINUOUS—TYPE No. 2 C

BLUE STREAK PRINTER, WASHER AND DRYER



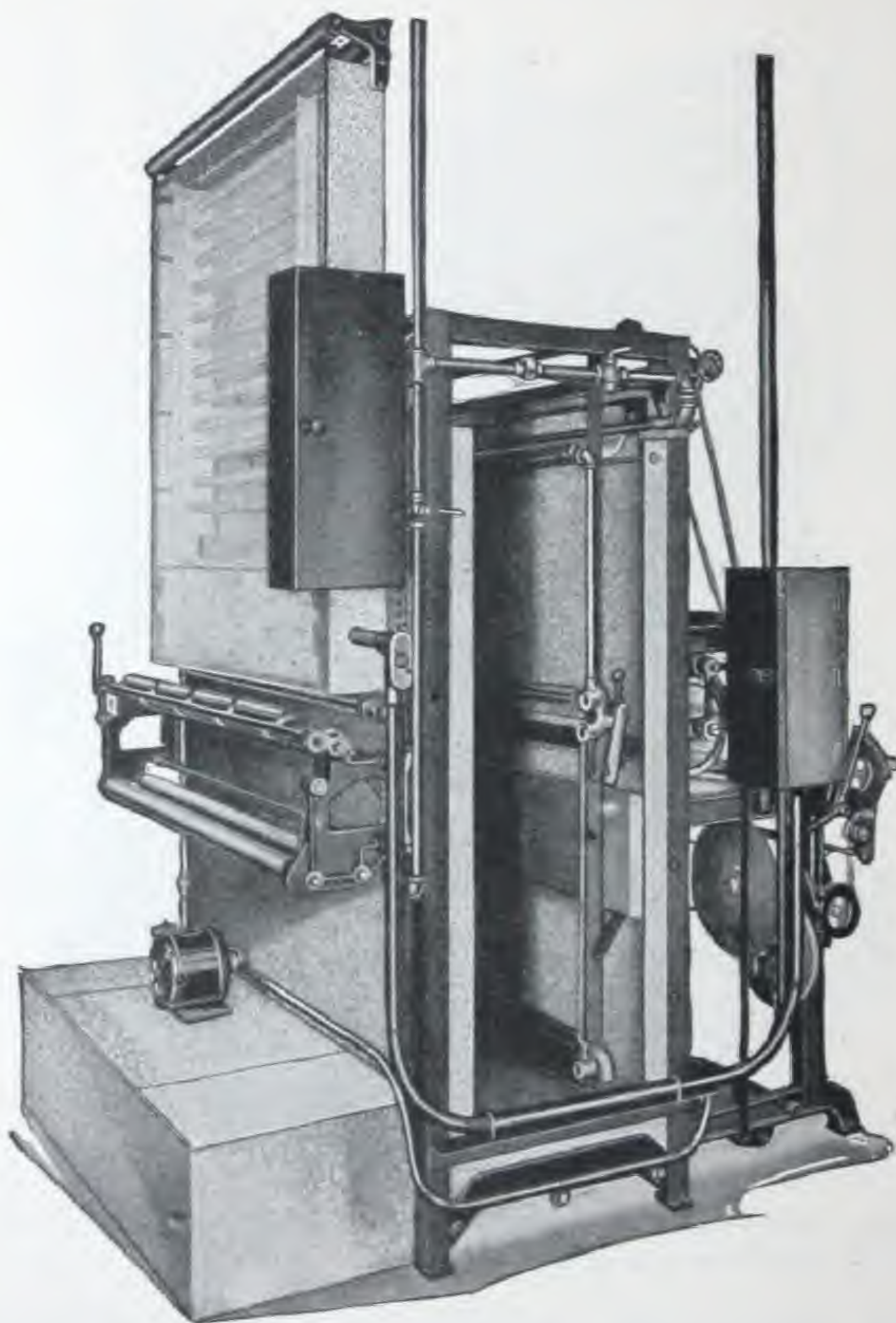
**Note:** All Electric Current automatically cut out of lamp circuit when lamps are **turned up** for trimming.

**Note:** Wide front lamp shield turns down, protecting machine parts from pieces of hot carbon.

**Note:** Speed Gear and Fan mounted directly on main frame are driven by same motor mounted on adjustable base.



REVOLUTE  
CONTINUOUS—TYPE No. 2 C  
BLUE STREAK PRINTER, WASHER AND DRYER



**Note:** Gear controlled carriage carrying fixing solution and final water sprays quickly moved back to allow easy threading of machine.

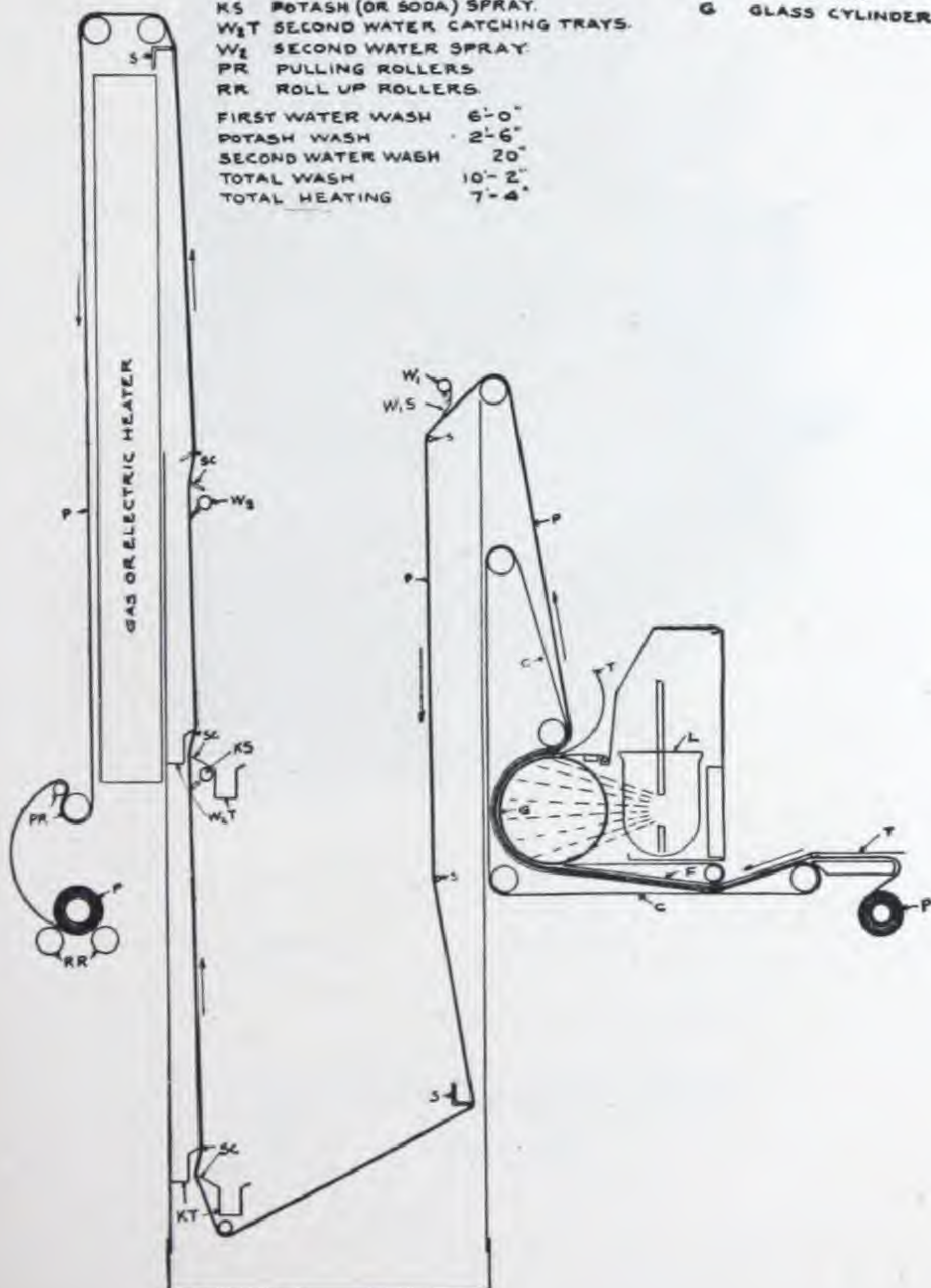
**Note:** Circulating manifold and sure carriage lock.



**REVOLUTE**  
**CONTINUOUS—TYPE No. 2 C**  
**BLUE STREAK PRINTER, WASHER AND DRYER**

W<sub>1</sub> FIRST WATER SPRAY  
W<sub>1</sub>S FIRST WATER SPREADER  
S PAPER SPREADING BARS  
KT POTASH CATCHING TRAYS  
SC SCRAPERS  
KS POTASH (OR SODA) SPRAY  
W<sub>2</sub>T SECOND WATER CATCHING TRAYS  
W<sub>2</sub> SECOND WATER SPRAY  
PR PULLING ROLLERS  
RR ROLL UP ROLLERS  
  
FIRST WATER WASH 6'-0"  
POTASH WASH 2'-6"  
SECOND WATER WASH 20"  
TOTAL WASH 10'-2"  
TOTAL HEATING 7'-4"

P PAPER  
T TRACING  
C CONTACT BELTS  
F FEED BELTS  
L ARC LAMP  
G GLASS CYLINDER





## CONTINUOUS BLUE PRINT MACHINES—Continued.

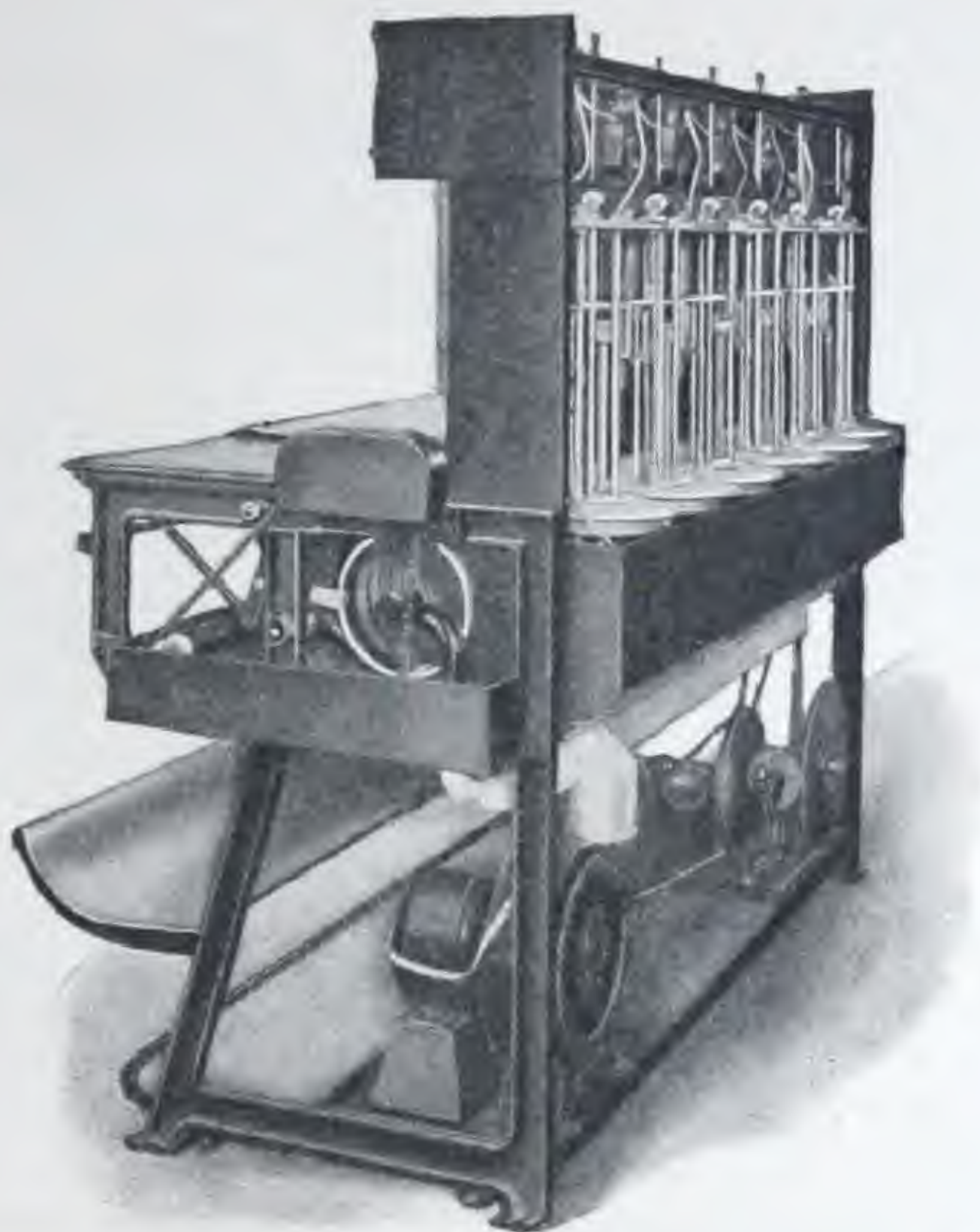


BLUE STREAK PRINTER

FRONT VIEW

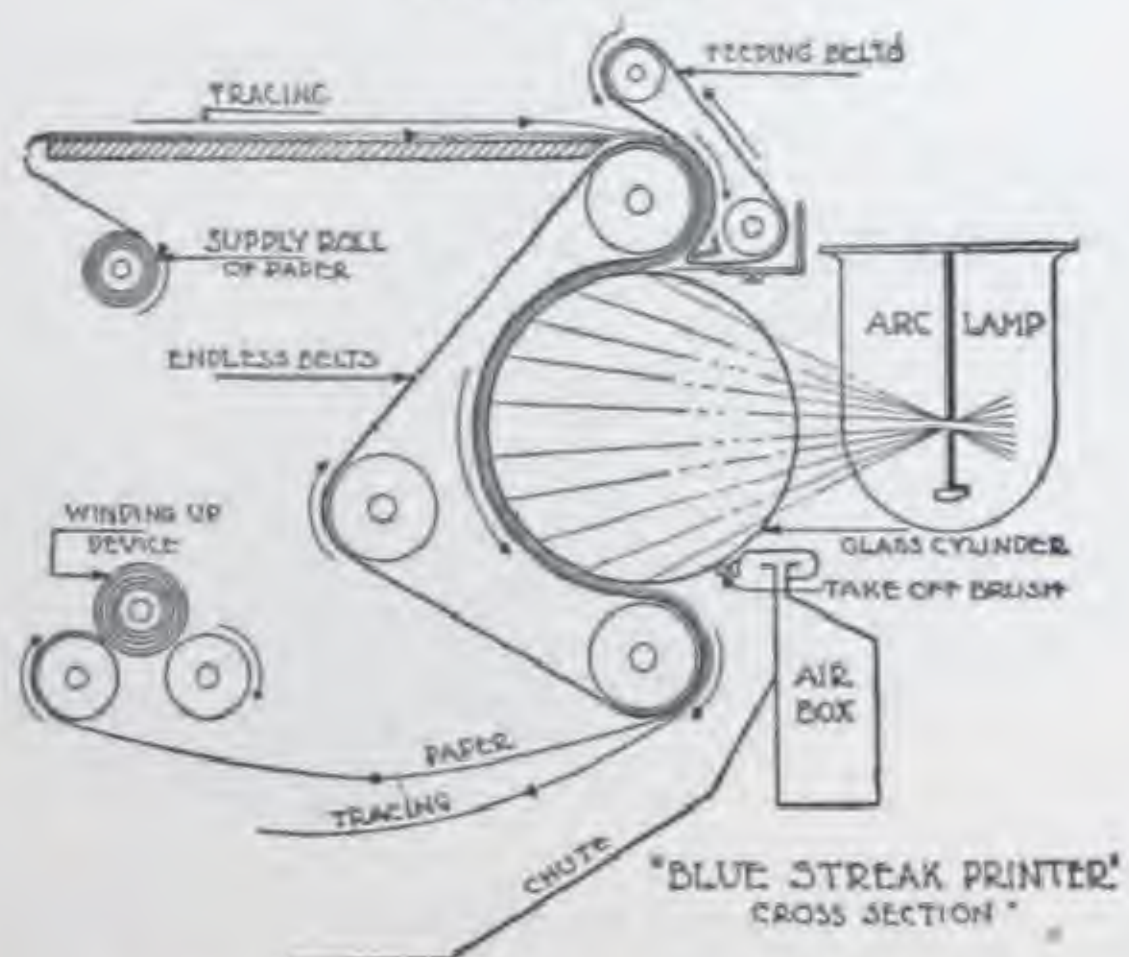


## CONTINUOUS BLUE PRINT MACHINES—Continued.



## BLUE STREAK PRINTER

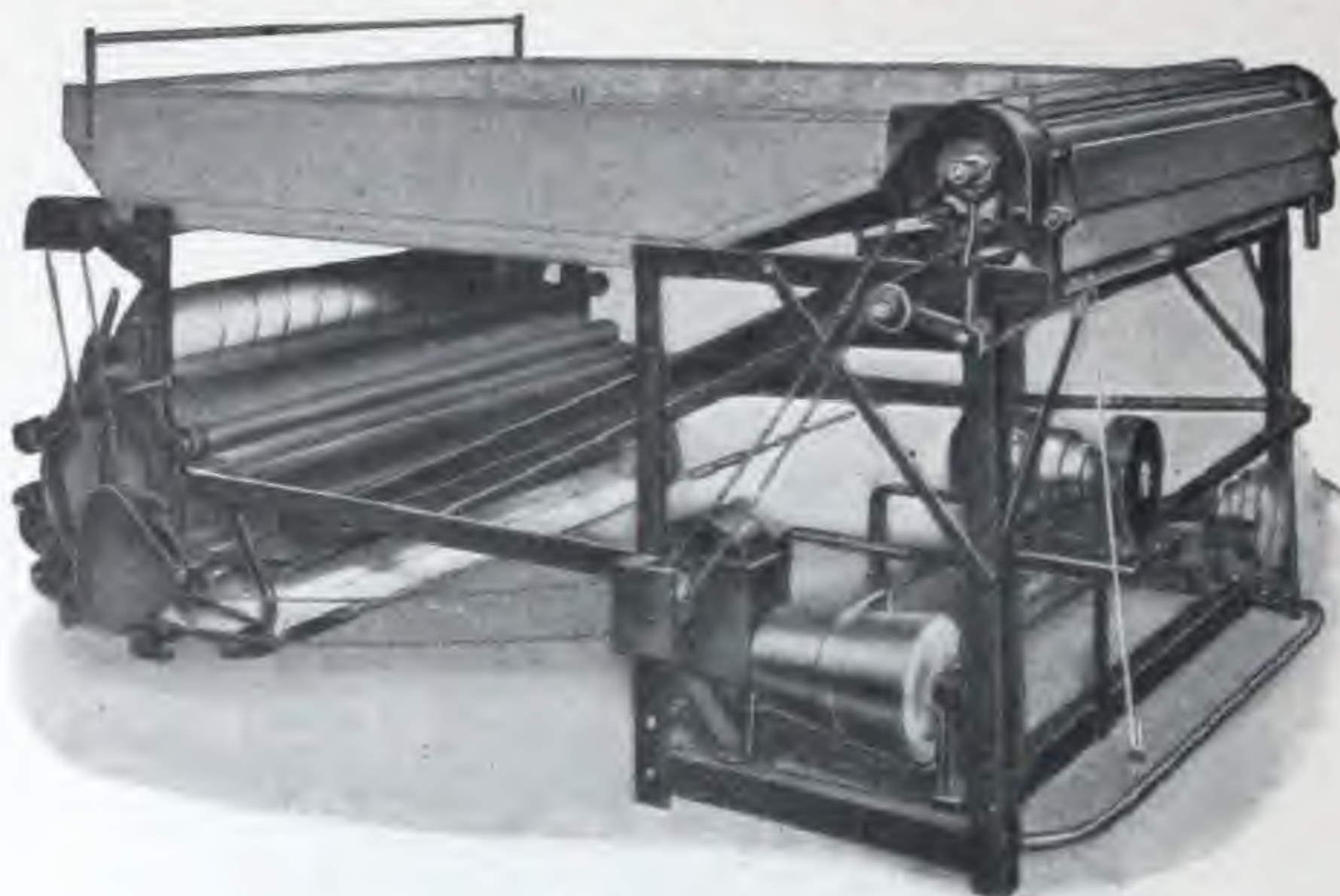
REAR VIEW



Cross Section No. 1—Blue Streak Machine

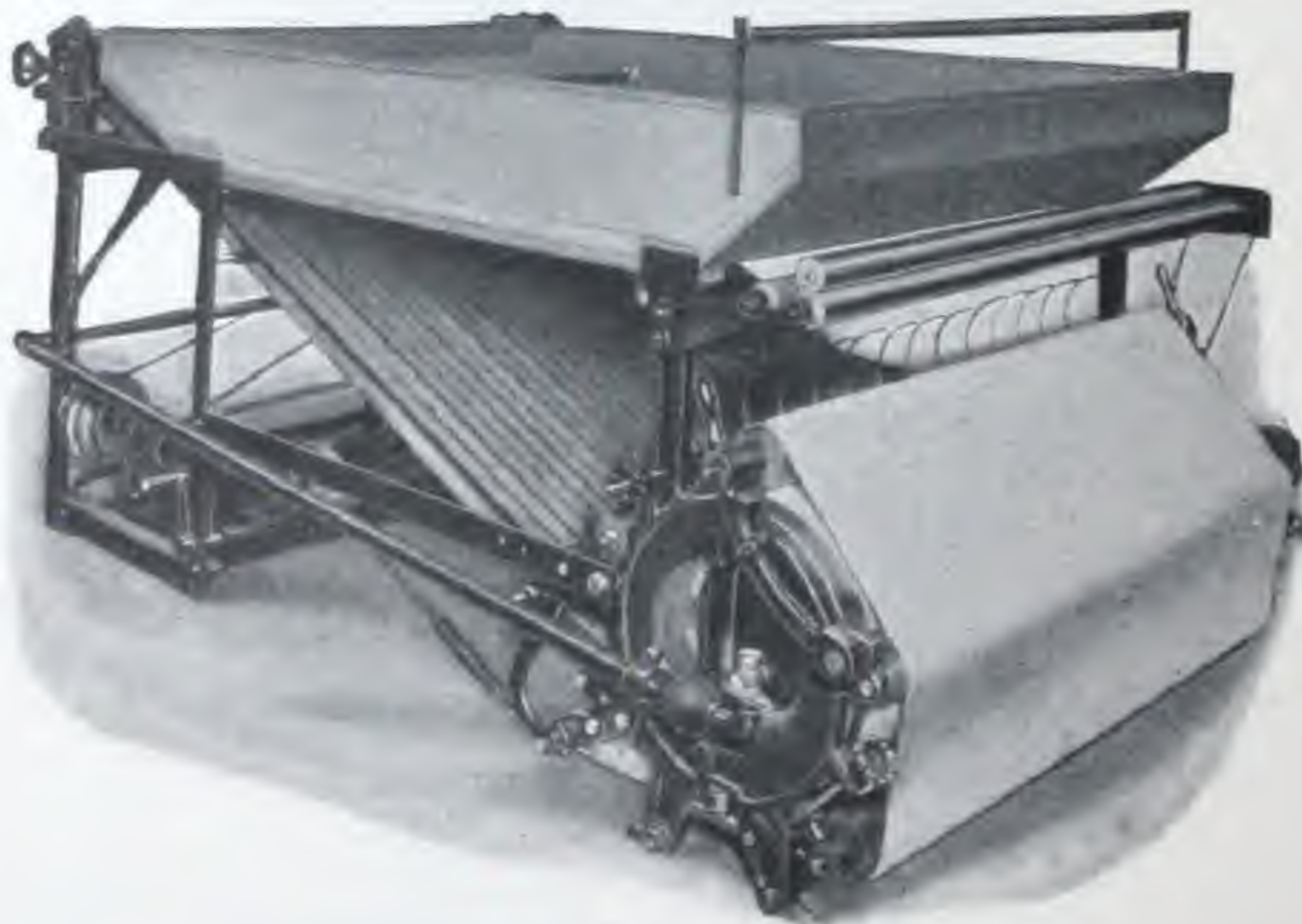


## REVOLUTE TYPE "A" WASHER, DRYER AND IRONER



FRONT VIEW

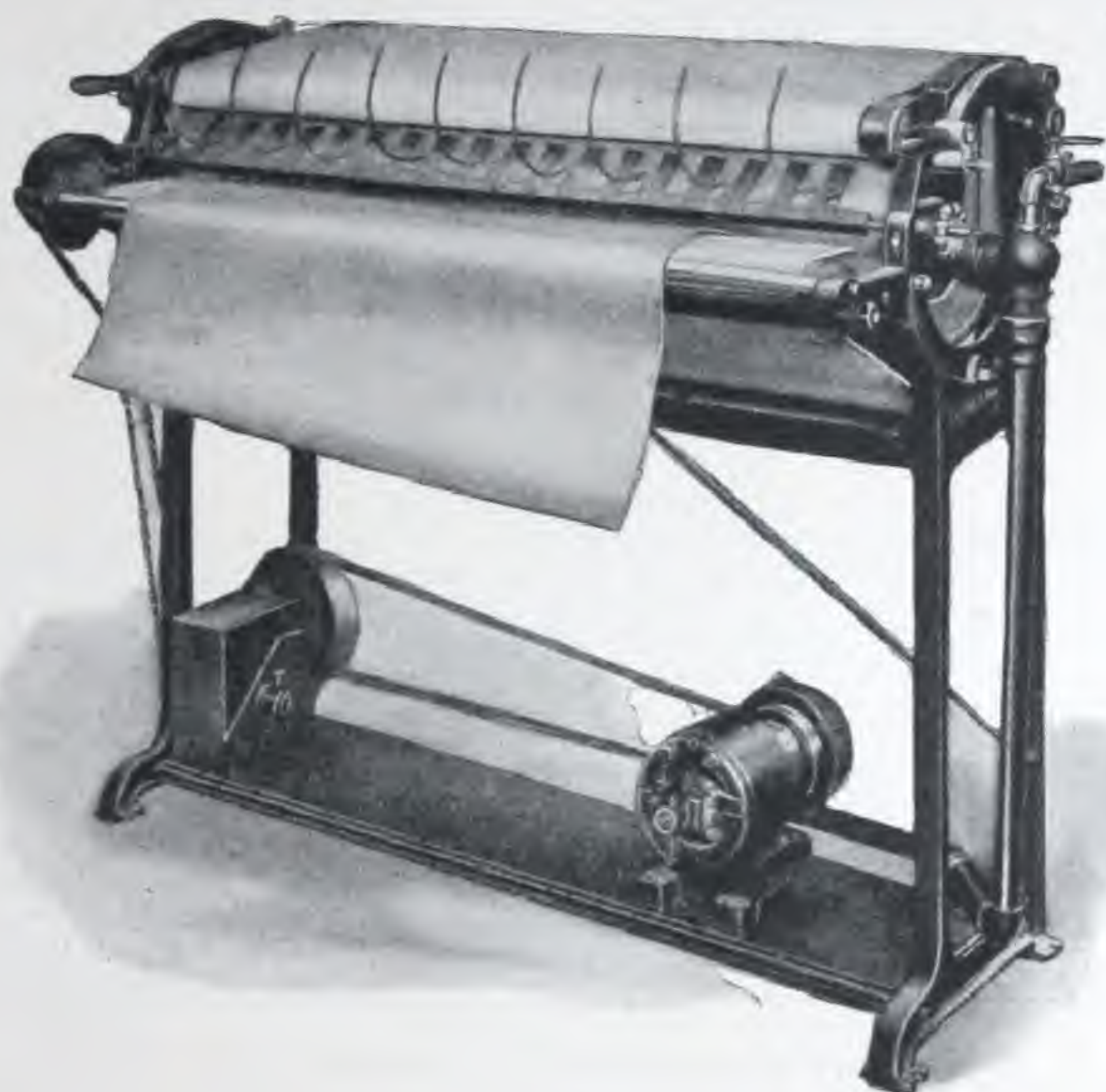
The "REVOLUTE" TYPE "A" Washer, Dryer and Ironer turns out finished prints with a MINIMUM of labor. Washed in the horizontal tank the prints are fed into wringer rollers and surplus water removed, then conveyed by transfer belts on which air drying occurs to the 16" diameter hot drum. The apron holds the prints in CONTACT with the drum during drying and ironing process and prints are delivered FINISHED from the drum.



REAR VIEW

Two sizes: Up to and including prints 45" wide.  
Up to and including prints 60" wide.



**REVOLUTE TYPE "B" DRYER AND IRONER**

The "Revolute" type "B" Dryer and Ironer will finish continuous rolls or cut sheets. The apron holds the prints in CONTACT with the 12" diameter hot drum during the entire process.

This machine can be equipped for either gas or electric drying and is highly recommended for DRYING PRINTS and PHOTOSTATS. Electric drying is especially recommended for Photostat drying, as electric heat is uniform.

The drum is TURNED and GROUND to an accurate cylinder as the efficiency of this dryer depends on the drum surface.

**Two Sizes**

Up to and including prints 45" wide.

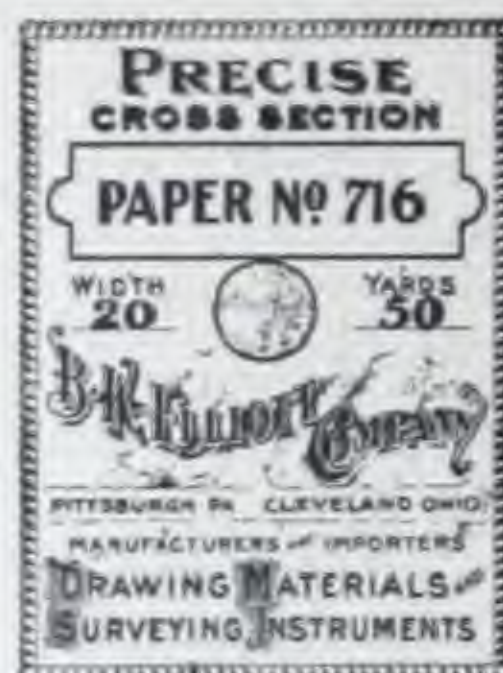
Up to and including prints 60" wide.



"PRECISE"  
PROFILE AND CROSS SECTION PAPERS AND CLOTHS



701-A



716



Plate A, 4 x 20 to one inch  
701-A

PLATE A—CONTINUOUS

		PER ROLL	PER YD.
701 - A	Green, 20 in. wide, drawing paper, 50-yard rolls.		
701 - B	Orange, 20 in. wide, drawing paper, 50-yard rolls.		
701½A	Green, 10 in. wide, drawing paper, 50-yard rolls.		
701½B	Orange, 10 in. wide, drawing paper, 50-yard rolls.		
702 - A	Green, 20 in. wide, mounted on muslin, 20-yd. rolls.		
702 - B	Orange, 20 in. wide, mounted on muslin, 20-yd. rolls.		
702½A	Green, 10 in. wide, mounted on muslin, 20-yd. rolls.		
702½B	Orange, 10 in. wide, mounted on muslin, 20-yd. rolls.		
703 - B	Orange, 20 in. wide, tracing paper, 50-yd. rolls.		
703½B	Orange, 10 in. wide, tracing paper, 50-yd. rolls.		
704 - A	Green, 20 in. wide, Highland cloth, 20-yd. rolls.		
704 - B	Orange, 20 in. wide, Highland cloth, 20-yd. rolls.		
705 - B	Orange, 20 in. wide, tracing cloth, 20-yd. rolls.		

Sample book will be sent on application



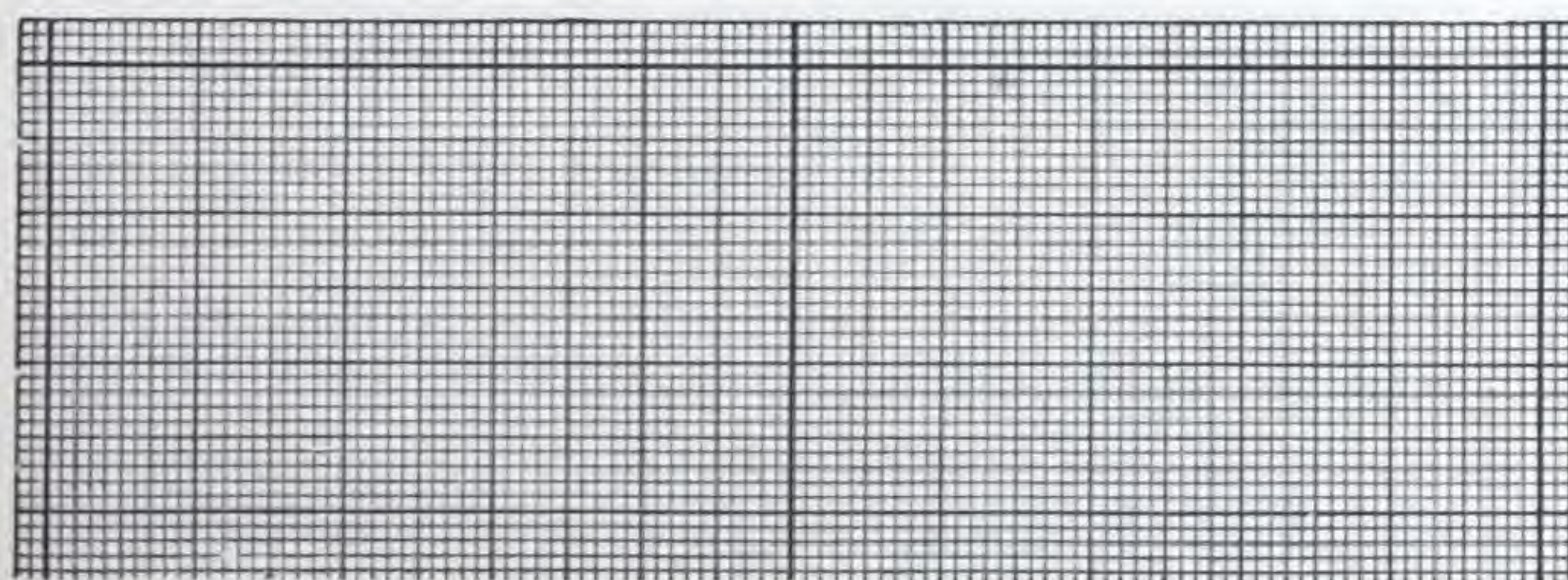
**"PRECISE" PROFILE PAPERS AND CLOTHS**

**Plate B, 4 x 30 to one inch**  
**707-A**

**PLATE B—CONTINUOUS**

PER ROLL PER YD.

- 707 - A Green, 20 in. wide, drawing paper, 50-yd. rolls . . . .  
 707 - B Orange, 20 in. wide, drawing paper, 50-yd. rolls . . .  
 707½A Green, 9 in. wide, drawing paper, 50-yd. rolls . . . .  
 707½B Orange, 9 in. wide, drawing paper, 50-yd. rolls . . . .  
 708 - A Green, 20 in. wide, mounted on muslin, 20-yd. rolls.  
 708 - B Orange, 20 in. wide, mounted on muslin, 20-yd. rolls  
 708½A Green, 9 in. wide, mounted on muslin, 20-yd. rolls.  
 708½B Orange, 9 in. wide, mounted on muslin, 20-yd. rolls.  
 709 - B Orange, 20 in. wide, tracing paper, 50-yd. rolls . . . .  
 709½B Orange, 9 in. wide, tracing paper, 50-yd. rolls . . . .  
 710 - A Green, 20 in. wide, on **Highland** cloth, 20-yd. rolls  
 710 - B Orange, 20 in. wide, on **Highland** cloth, 20-yd. rolls  
 711 - A Orange, 20 in. wide, tracing cloth, 20-yd. rolls . . . .



**Millimeters**  
**727-A**

PER ROLL PER YD.

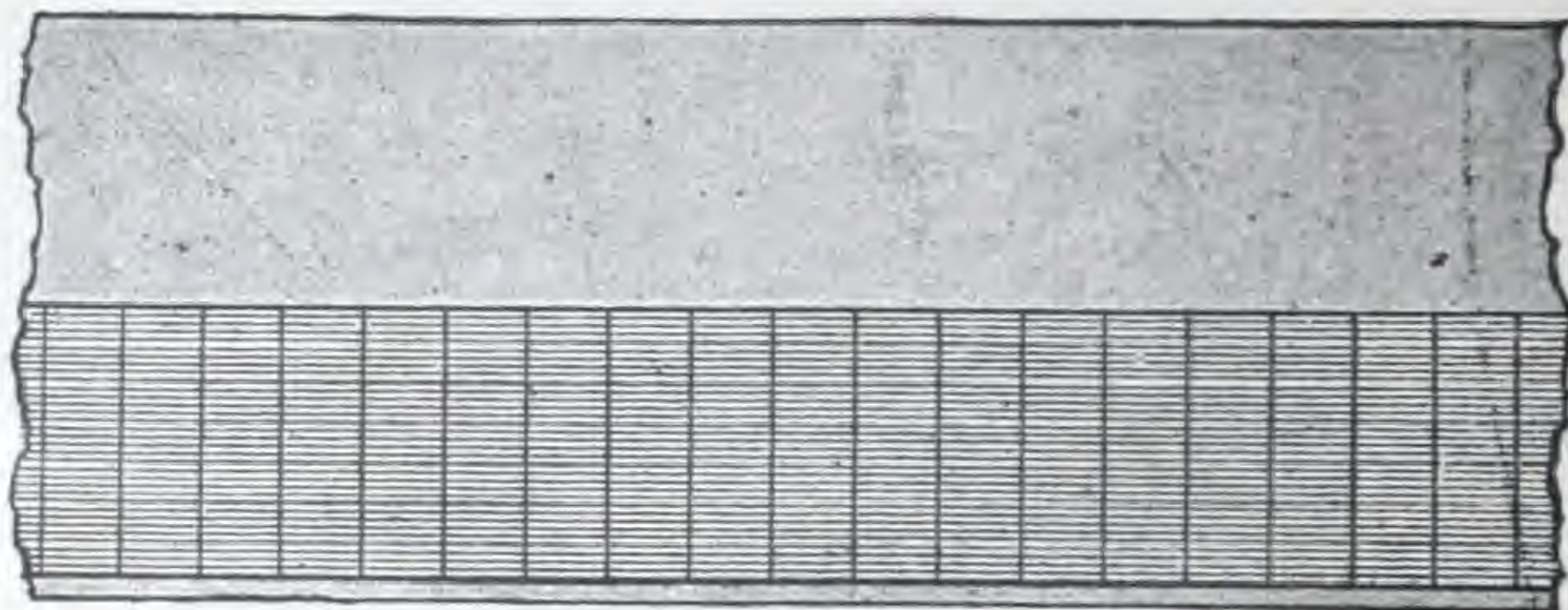
- 727A Green, 50 cm. wide, drawing paper, 50-yd. rolls . . . .  
 727B Orange, 50 cm. wide, drawing paper, 50-yd. rolls . . . .  
 728B Orange, 50 cm. wide, tracing paper, 50-yd. rolls . . . .

**Sample book will be sent on application**



## PRECISE PROFILE-PLAN PAPERS AND CLOTHS

Width of paper 22 in.



Our Profile-Plan Papers and Cloths have the ruling along the lower half of the paper, the upper half being blank, which provides space for necessary memoranda, sketches of cuts, fills, etc.



Plate A. 4 x 20 to one inch.

## PRECISE PROFILE-PLAN PAPERS AND CLOTHS

Per Yard

706	A Green, engraving	10 in. wide, Drawing paper, 50-yd roll
706	B Orange, " " "	do. do. 50 " "
706 1/2	A Orange, " " "	Tracing paper, 50 " "
706 1/2	B Orange, " " "	Tracing cloth, 20 " "



Plate B. 4 x 30 to one inch.

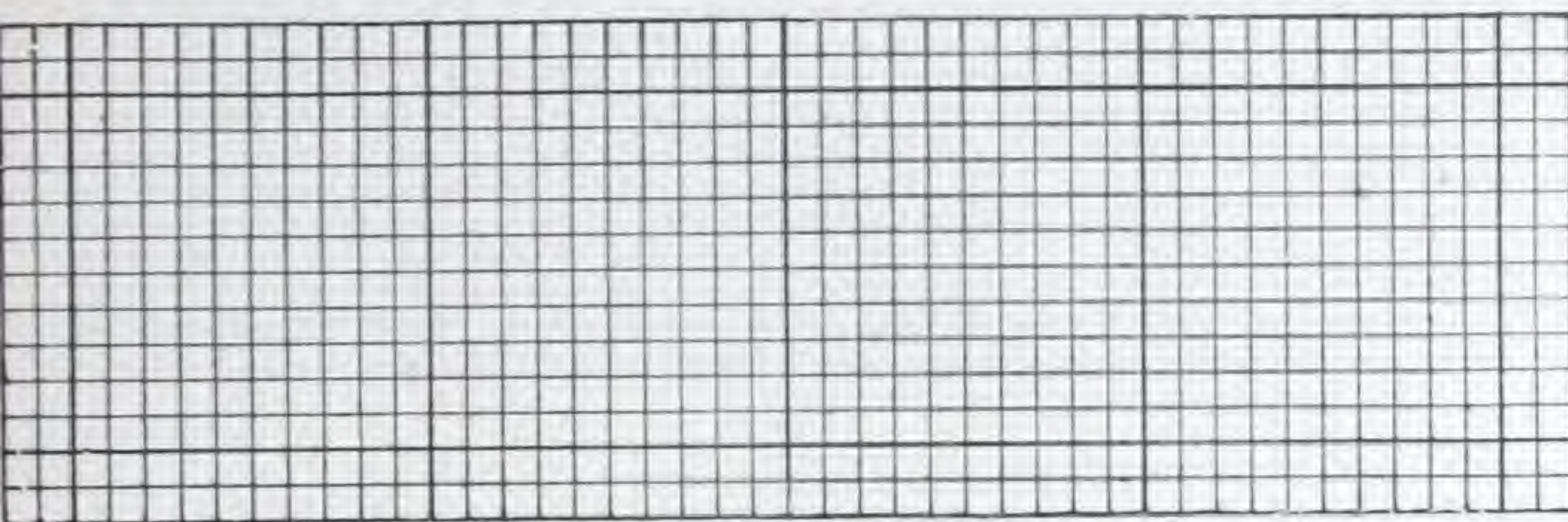
## PRECISE PROFILE-PLAN PAPERS AND CLOTHS

Per Yard

710 1/2	A Green, 9 in. wide, Drawing paper.....	50-yd roll
710 1/2	B Orange, 9 " " do. do. ....	50 " "
711 1/2	A Orange, 9 " " Tracing paper .....	50 " "
711 1/2	B Orange, 9 " " Tracing cloth .....	20 " "



**"PRECISE"**  
**CROSS SECTION PAPERS AND CLOTHS**



10 x 10 to one inch

714-A

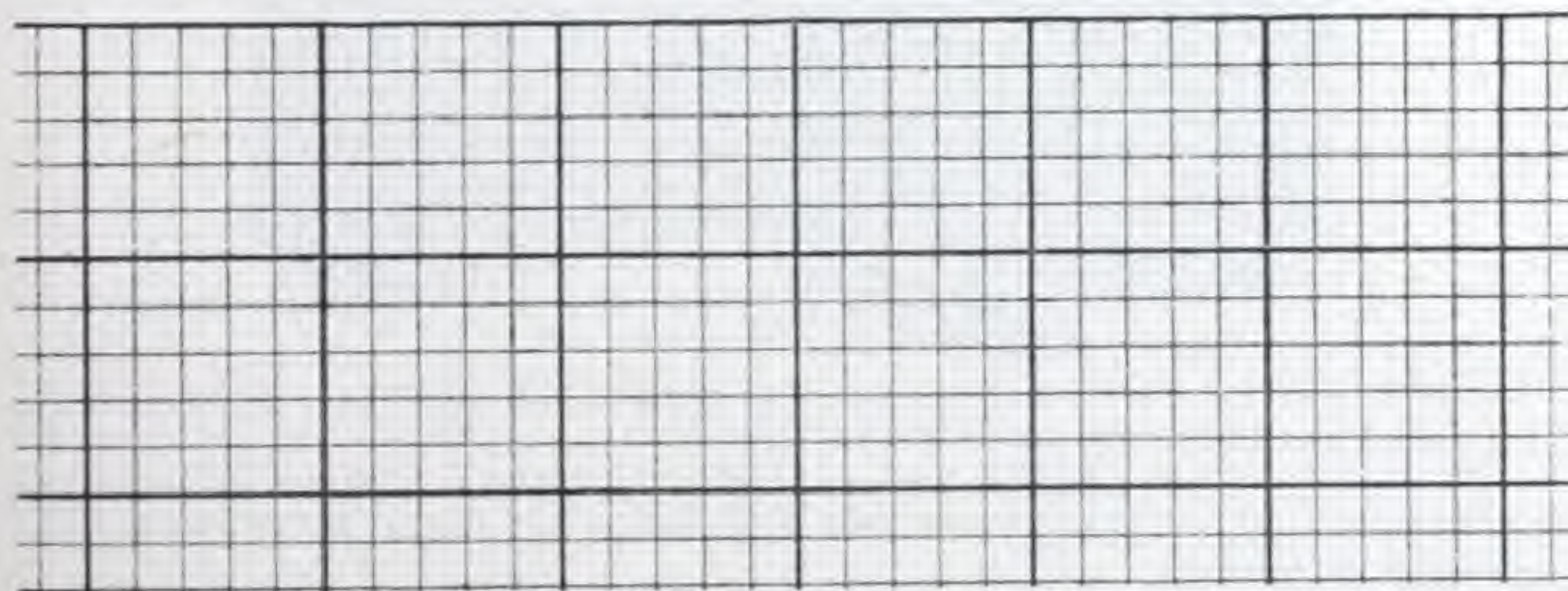
PER QUIRE    PER SHEET

- 712 Sheets, engraving, 16 x 20 inches.....  
713 Sheets, engraving, 16 x 20 inches, transparent....

**CONTINUOUS**

PER ROLL    PER YD.

- 714A Green, 20 in. wide, drawing paper, 50-yd. rolls.....  
714B Orange, 20 in. wide, drawing paper, 50-yd. rolls.....  
715A Green, 20 in. wide, mounted on muslin, 20-yd. rolls..  
715B Orange, 20 in. wide, mounted on muslin, 20-yd. rolls..  
716 Orange, 20 in. wide, tracing paper, 50-yd. rolls.....  
717A Green, 20 in. wide, on **Highland** cloth, 20-yd. rolls..  
717B Orange, 20 in. wide, on **Highland** cloth, 20-yd. rolls..  
718B Orange, 20 in. wide, tracing cloth, 20-yd. rolls.....



8 x 8 to one inch (sheets only)

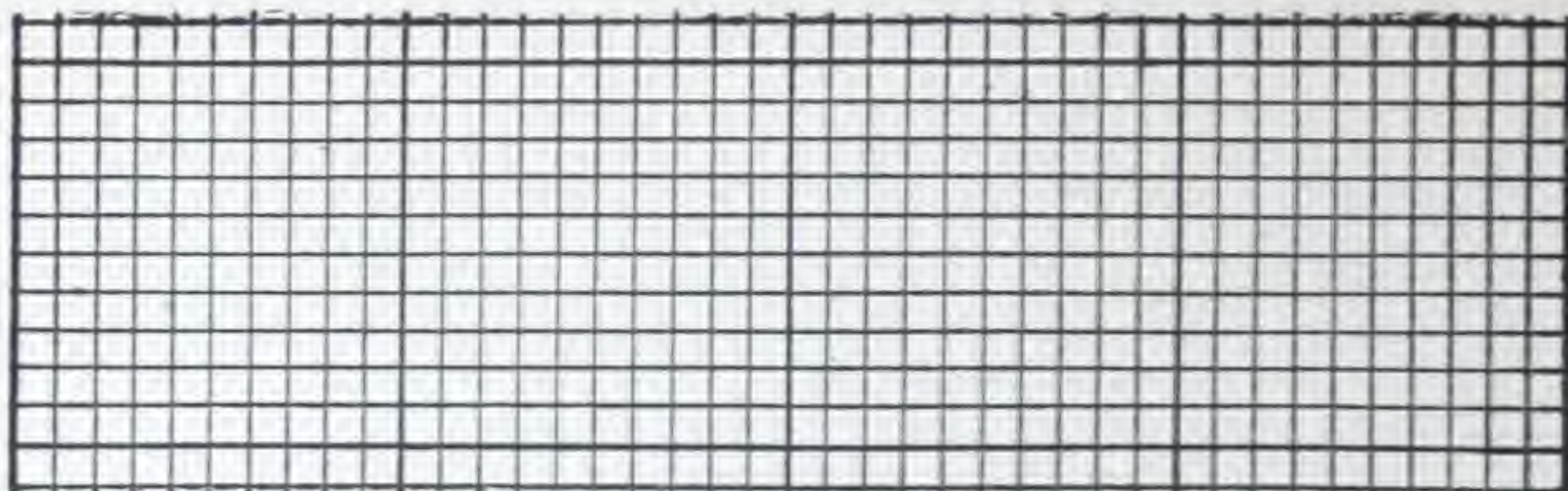
PER QUIRE    PER SHEET

- 719 Sheets, engraving, 16 $\frac{1}{4}$  x 21 $\frac{7}{8}$  inches.....  
720 Sheets, engraving, 16 $\frac{1}{4}$  x 21 $\frac{7}{8}$  inches, transparent....

Sample book will be sent on application



## RULED CROSS SECTION PAPERS



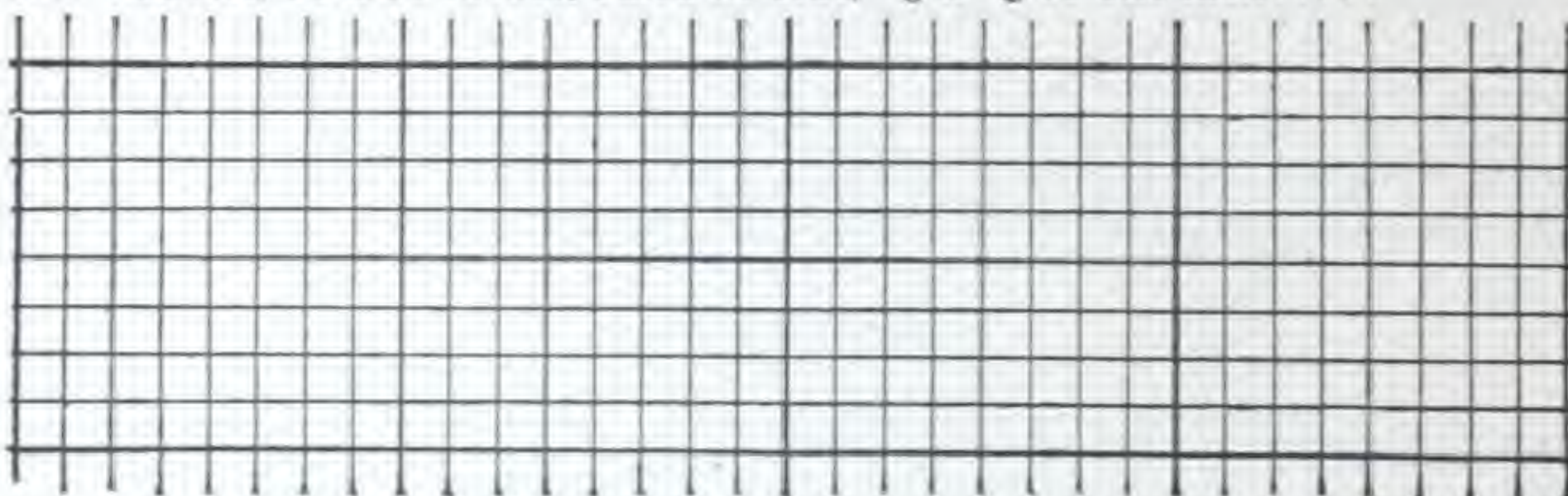
724

PER QUIRE

724 Sheets, 16 x 21 inches, ruled in blue, 10 x 10 to one inch.....

724A Sheets, 20 x 28 inches, ruled in blue, 10 x 10 to one inch.....

724B Sheets, 16 x 21 inches, ruled in blue, 5 x 5 to one inch.....



725

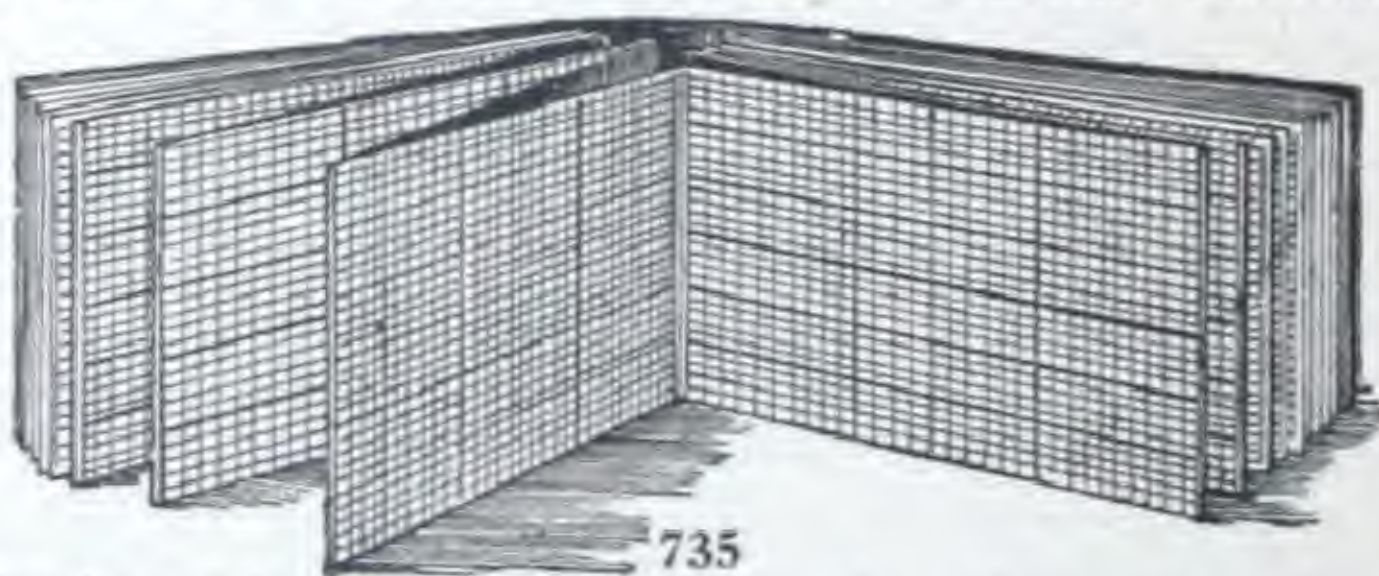
PER QUIRE

725 Sheets, 16 x 21 inches, ruled in blue, 8 x 8 to one inch.....

726 Topographical paper, 16 x 21 inches, ruled in blue and red, 400 feet to one inch.....

Ruled cross section paper of any desired ruling furnished to order.

PROFILE BOOKS—Continuous. Leather Covered



735

These books are folded like a map, to replace the continuous rolls of profile paper, and the pages are mounted on muslin.

Each leaf, or two pages facing, contain six thousand feet—a "Section"—as generally laid out for the construction of a road. The paper lays smooth and is of extra fine quality.

735 Plate A—4 horizontal, 20 vertical lines to the inch:  $5\frac{1}{2}$  x 8 inches. Printed in green.

Miles	10	15	25	50	100
Each					

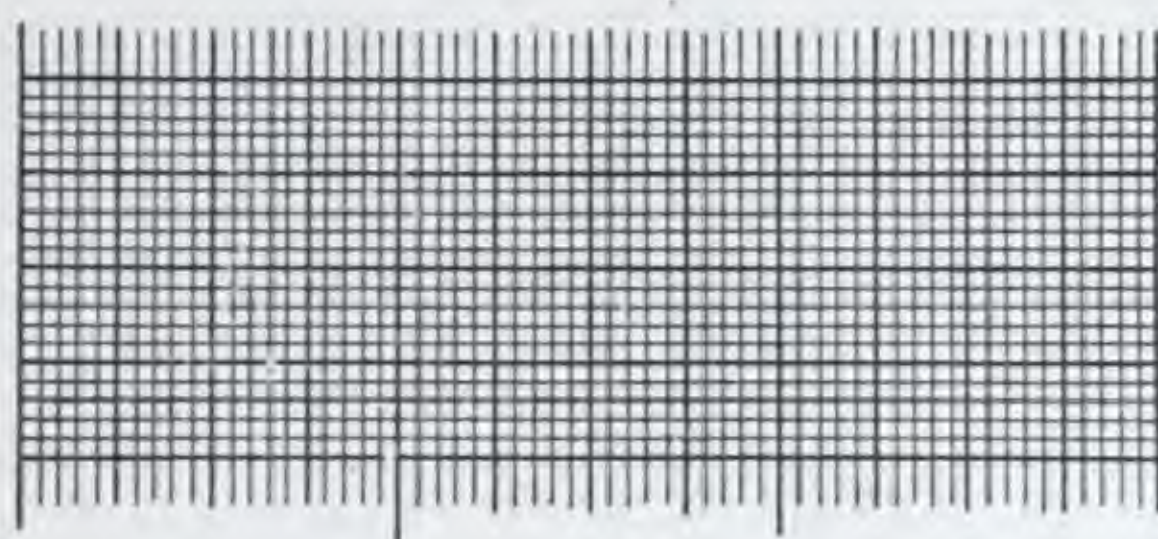
736 Plate B—4 horizontal, 20 vertical lines to the inch:  $4\frac{3}{4}$  x 8 inches. Printed in green.

Miles	10	15	25	50	100
Each					

The above books can also be furnished in Metric ruling. Write for special prices. We can also furnish Profile Books (not continuous) Plate A or B, printed in Green, and will be pleased to quote special prices.



## CROSS SECTION PAPER IN SHEETS



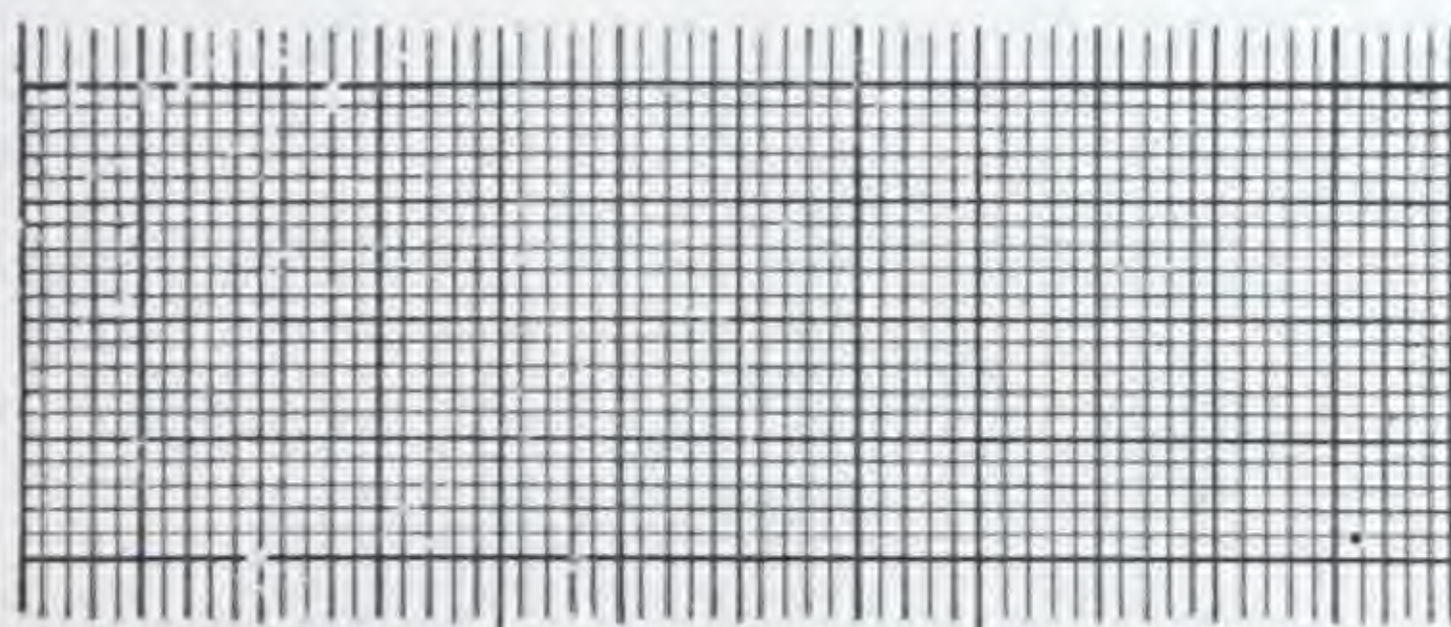
728A

### CENTIMETER

We have two plates, 6 x 9 inches; one divided in inches, with 20ths as a subdivision, and one in centimeters, with 10ths as a subdivision.

COLOR    PER 100    PER QUIRE

- |      |   |       |
|------|---|-------|
| 728A | Sheets, Engraving, 6 x 9 inches, medium bond paper.....     | Olive |
| 728B | Sheets, engraving, 6 x 9 inches, thin bond paper.....       | Olive |
| 728C | Sheets, engraving, 6 x 9 inches, superfine white paper..... | Blue  |



729A

The 10 x 15-inch plate is in inches, with 20ths as subdivisions.

COLOR    PER 100    PER QUIRE

- |      |   |       |
|------|---|-------|
| 729A | Sheets, engraving, 10 x 15 inches, medium bond paper.....     | Olive |
| 729B | Sheets, engraving, 10 x 15 inches, thin bond paper.....       | Olive |
| 729C | Sheets, engraving, 10 x 15 inches, superfine white paper..... | Blue  |

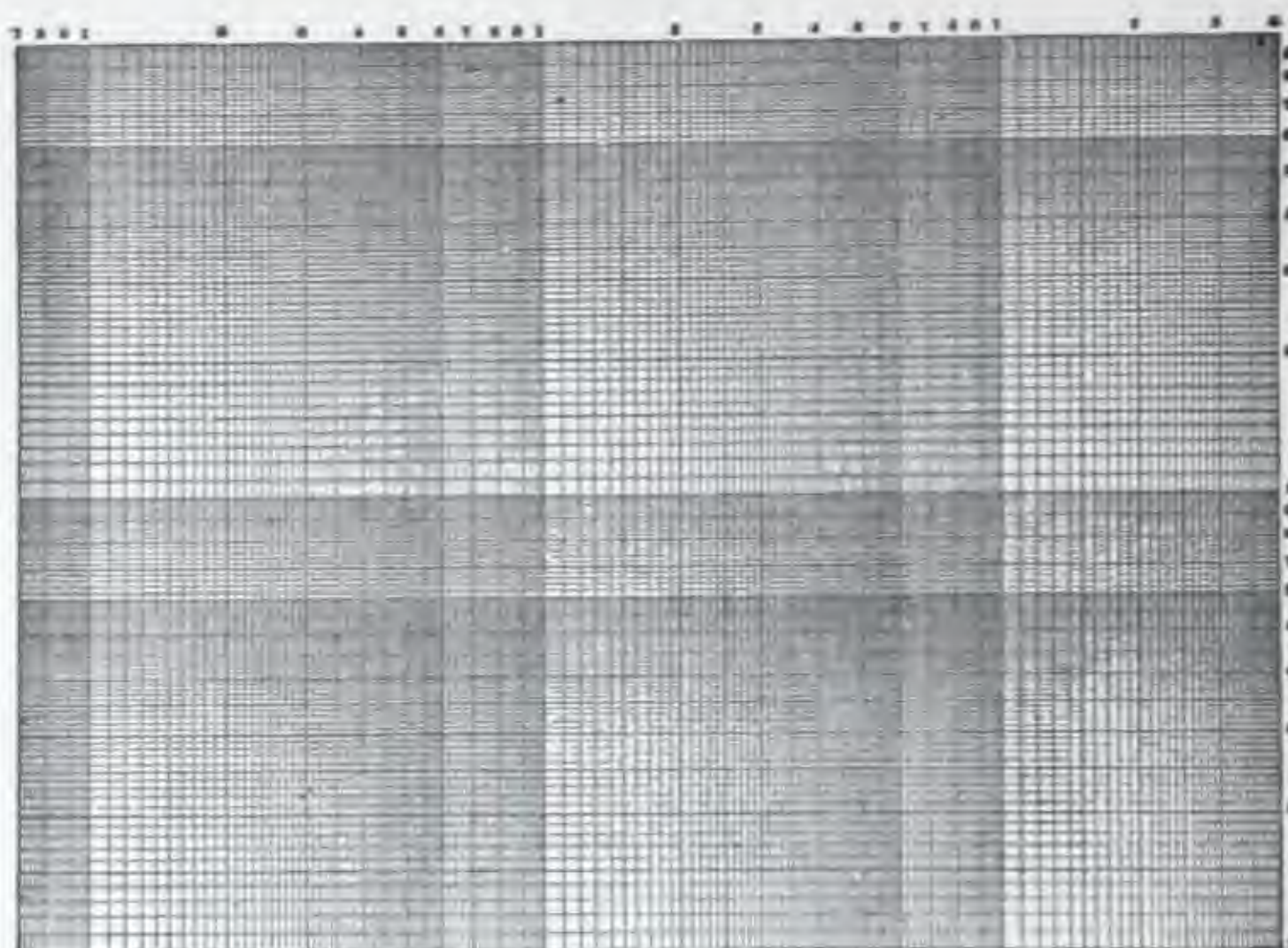
These plates are accurate and used by all Engineering Departments of Cornell University.

Special prices on orders for lots of 500 or more sheets.

Orders of 500 sheets or more can be made on any kind of paper and color without extra charge.



## LOGARITHMIC CROSS SECTION PAPERS

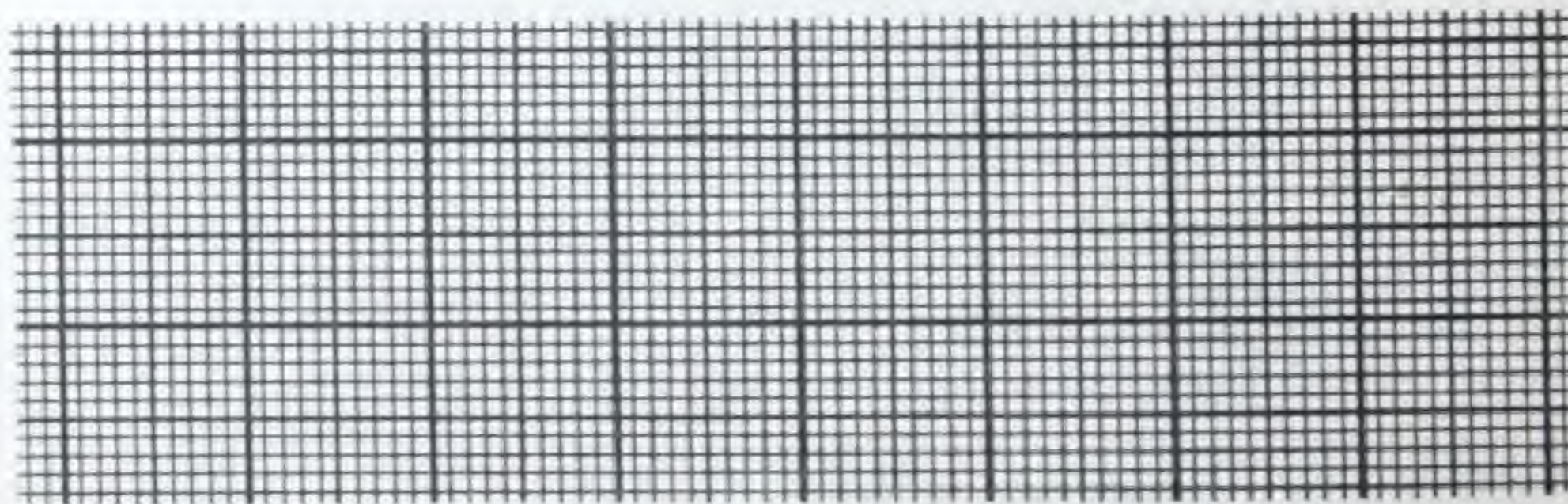


729½. Sheets, engraving 10 x 10 in., tracing paper, neutral tint, . . . . PER DOZ.

On this paper the scales in each direction are logarithmic instead of uniform as in other cross section papers. The numbers and divisions marked are placed at such points that their distances from the origin are proportional to the logarithm of such numbers instead of to the numbers themselves. By means of this paper logarithmic operations are performed graphically, without reference to the logarithms themselves. Engineering computations are expedited by its use, and various relationships can be represented.

### CONSTRUCTOR'S SKETCH PAPER

#### PRINTED



729 D

10 x 10 to the half-inch, fifth lines heavy

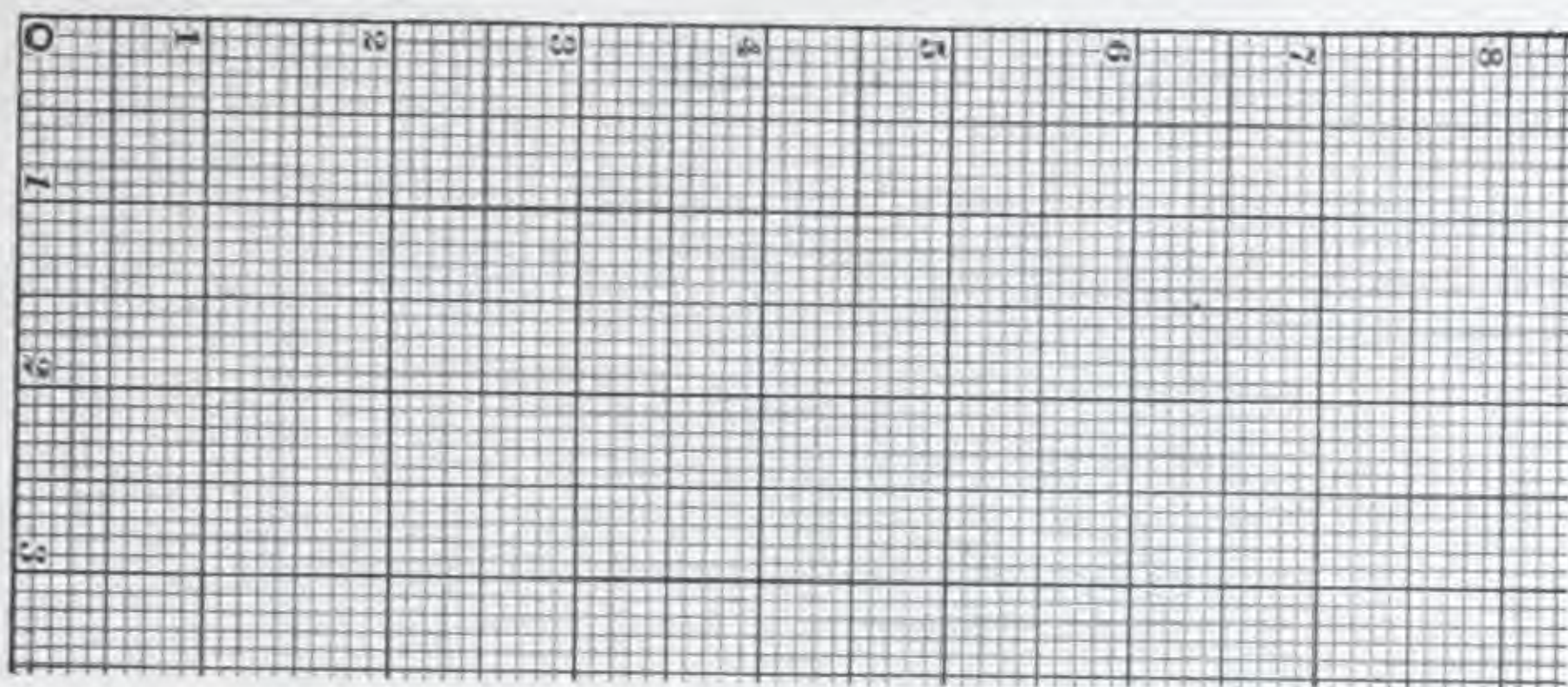
PER QUIRE

729D Sheets, neutral tint, Engraving 7½ x 10 in., Tracing Paper . . . . .

729E Sheets, orange, Engraving 7½ x 10 in., Tracing Paper . . . . .



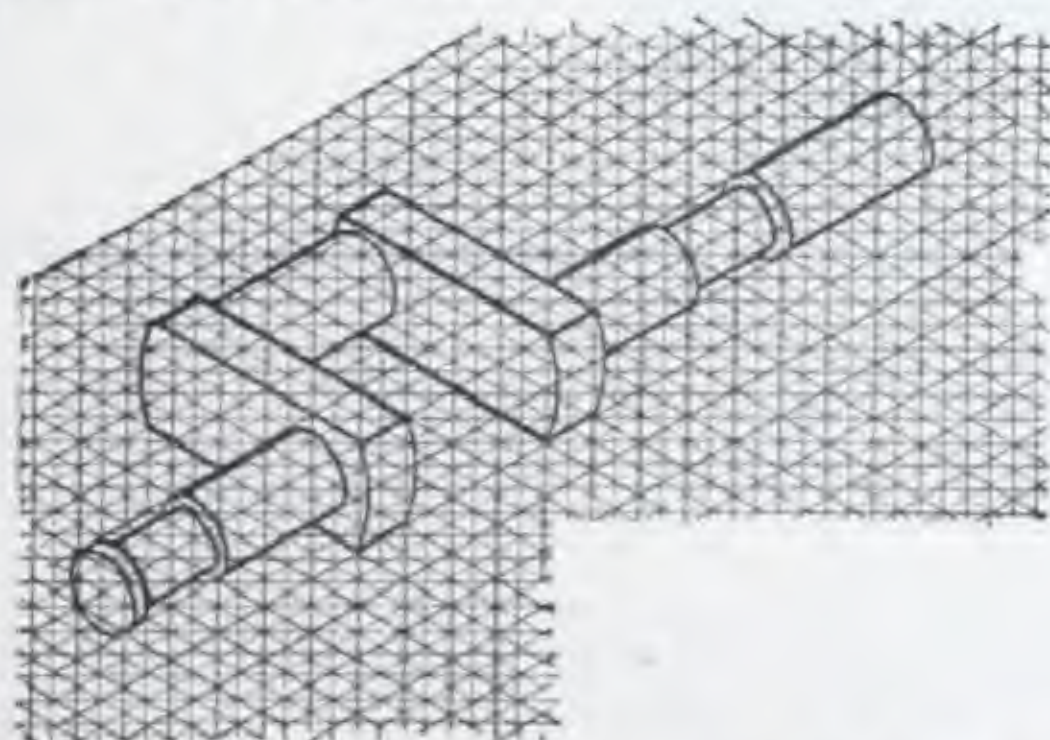
## WEBB'S CO-ORDINATE PAPER



Webb's Co-ordinate paper is a convenient and accurate cross section paper for drafting rooms, technical schools, laboratories, etc. It is printed from accurate engravings in a neutral olive tint, which can be photographed or photo-printed. The scale of the rulings is between the English and French ( $\frac{1}{2}$  inches and centimeters) subdivided 10x10. The lines of Nos. 726A to 726D are numbered in two directions for ready reference to any point on the paper and the sheets are punched for portfolio binding. A table of natural tangents is printed on the margin of some of the larger size sheets, for laying off angles.

			SHEET
726A	Best Linen Record Paper,	$8\frac{3}{4} \times 11\frac{3}{8}$ inches,	180x220 squares.....
726B	Best Linen Record Paper,	$11\frac{3}{8} \times 17\frac{3}{4}$ inches,	240x350 squares.....
726C	Best Thin Bond Paper,	$8\frac{3}{4} \times 11\frac{3}{8}$ inches,	180x220 squares.....
726D	Best Thin Bond Paper,	$11\frac{3}{8} \times 17\frac{3}{4}$ inches,	240x350 squares.....
726E	Best Thin Bond Paper,	8 x $10\frac{1}{2}$ inches,	160x220 squares.....
726F	Best Thin Bond Paper,	$10\frac{1}{2} \times 16$ inches,	220x330 squares.....
726H	Smooth Drawing Paper,	8 x $10\frac{1}{2}$ inches,	160x220 squares
			per pad of 50 sheets.....

## ISOMETRIC CROSS SECTION PAPER



A drawing on Isometric Paper may be scaled in three main directions, the axis of which are  $120^\circ$  apart, one being vertical, the other being at  $30^\circ$  from the horizontal; all horizontal lines are laid along the  $30^\circ$  line in either direction. A cube becomes a hexagon, and circles ellipses. It is especially adapted for use by machine designers, patent office draftsmen and architects; in fact, there is no branch of mechanical drawing or designing that can not use this paper to a distinct advantage.

		EACH
32A	Ruled in green, in pads of 40 sheets,	6x9 inches.....
32B	Ruled in green, in pads of 40 sheets,	9x12 inches.....
32C	Ruled in green, in sheets 12x18 inches,	per 40 sheets.....



## RULED CROSS SECTION PAPERS IN PADS

EACH

- 730 8x10 inch, 10 x 10 to one inch, ruled in blue, 24 sheets.....  
 731 8x10 inch, 8x 8 to one inch, ruled in blue, 24 sheets.....  
 760 Architect's Certificate Books, 100 blanks, good quality paper.....

## OIL CLOTH

For Protection of Architects' Drawings

PER YD.

- 761 Black Oil Cloth, 48 inches wide.....  
 762 Green Oil Cloth, 48 inches wide.....



766



768

## CROWELL'S ADHESIVE TAPE

is used for stretching drawing paper, holding tracing sheets and for binding and mending blue prints and drawings. It consists of a  $\frac{3}{4}$ -inch strip of good quality cloth, coated on one side with a strong adhesive preparation. Furnished in either black or white.

- 766 Crowell's Adhesive Tape, per box of 50 feet.....  
 767 Dennison's Transparent Adhesive Tape, 12-yd Spools, Each.....  
 768 Dennison's Transparent Adhesive Tape, 4-yd Spools, Each.....

## DESCRIPTION OF DUPLICATING FIELD BOOKS

Our Duplicating Field Book was made to fill a demand from engineers in the field where it is necessary to keep the office supplied with notes while the work is in progress. The engineer also has a copy, which is very convenient. They can be furnished with either the original leaf perforated and duplicate leaf fast, or the duplicate leaf perforated and the original leaf fast.

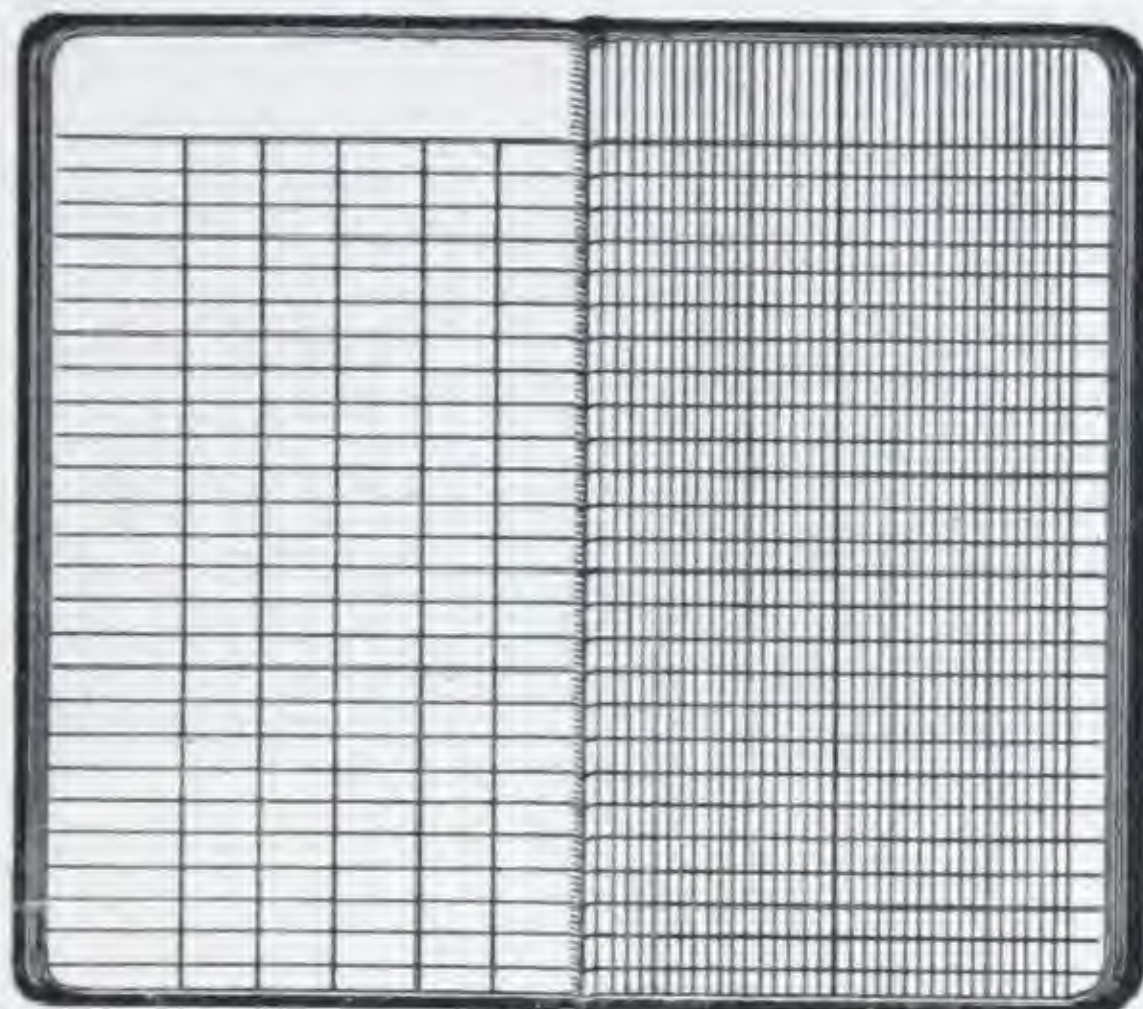
See lower illustration, page 43



## ENGINEER'S FIELD BOOKS

Our Books are bound in leather and are thread sewed and reinforced with muslin, making them much stronger than the wire stitched goods now on market.

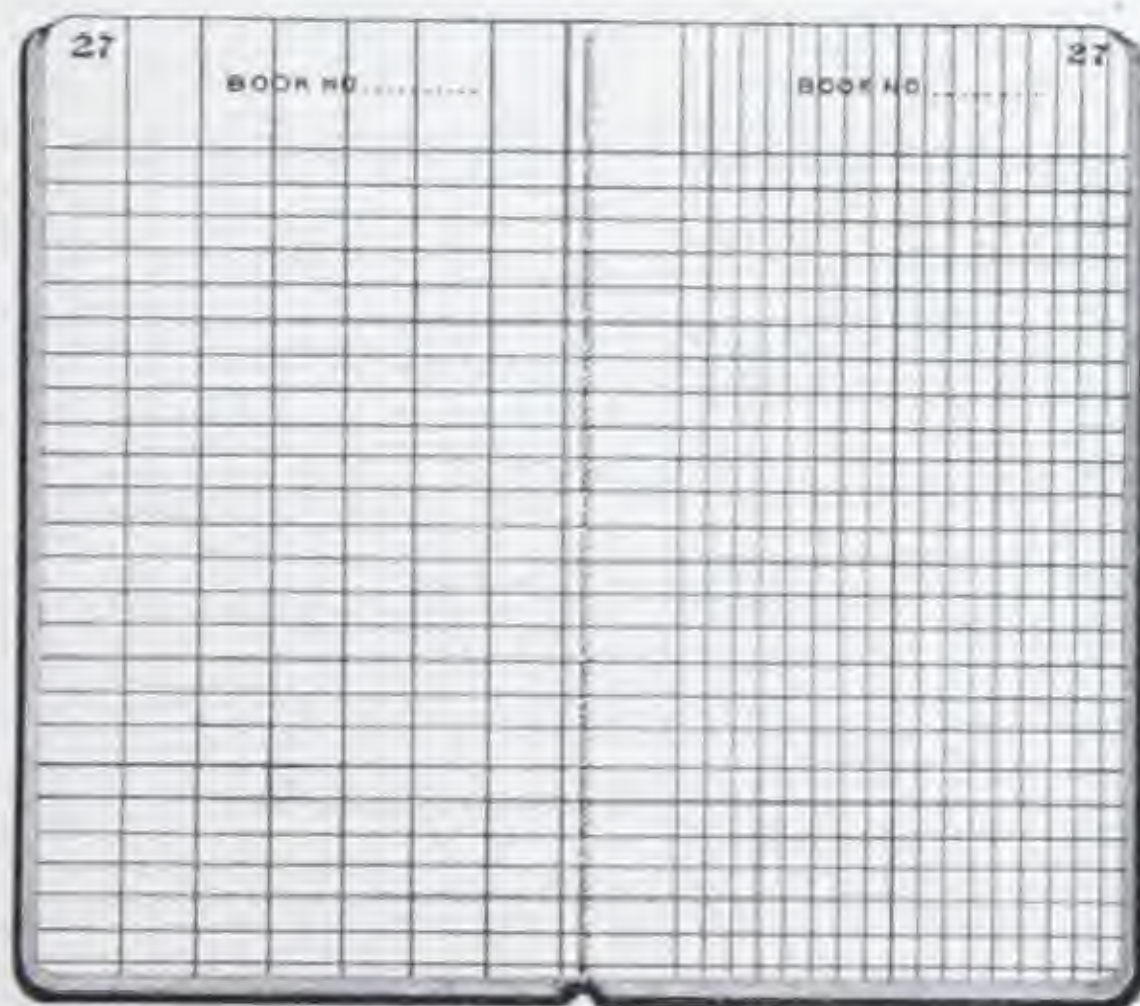
Other patterns of Field, Cross-Section and Record Books made to order in lots of not less than one-half gross of a kind.



740

PER DOZ. EACH

- 40 Field Book,  $4\frac{1}{2} \times 7\frac{1}{2}$ ", 80 leaves, smooth paper, with tables..  
 41 Field Book,  $4\frac{1}{2} \times 7\frac{1}{2}$ ", 60 leaves, smooth paper, with tables..  
 60 Field Book,  $4\frac{1}{4} \times 6\frac{3}{4}$ ", 60 leaves, smooth paper, with tables..



742

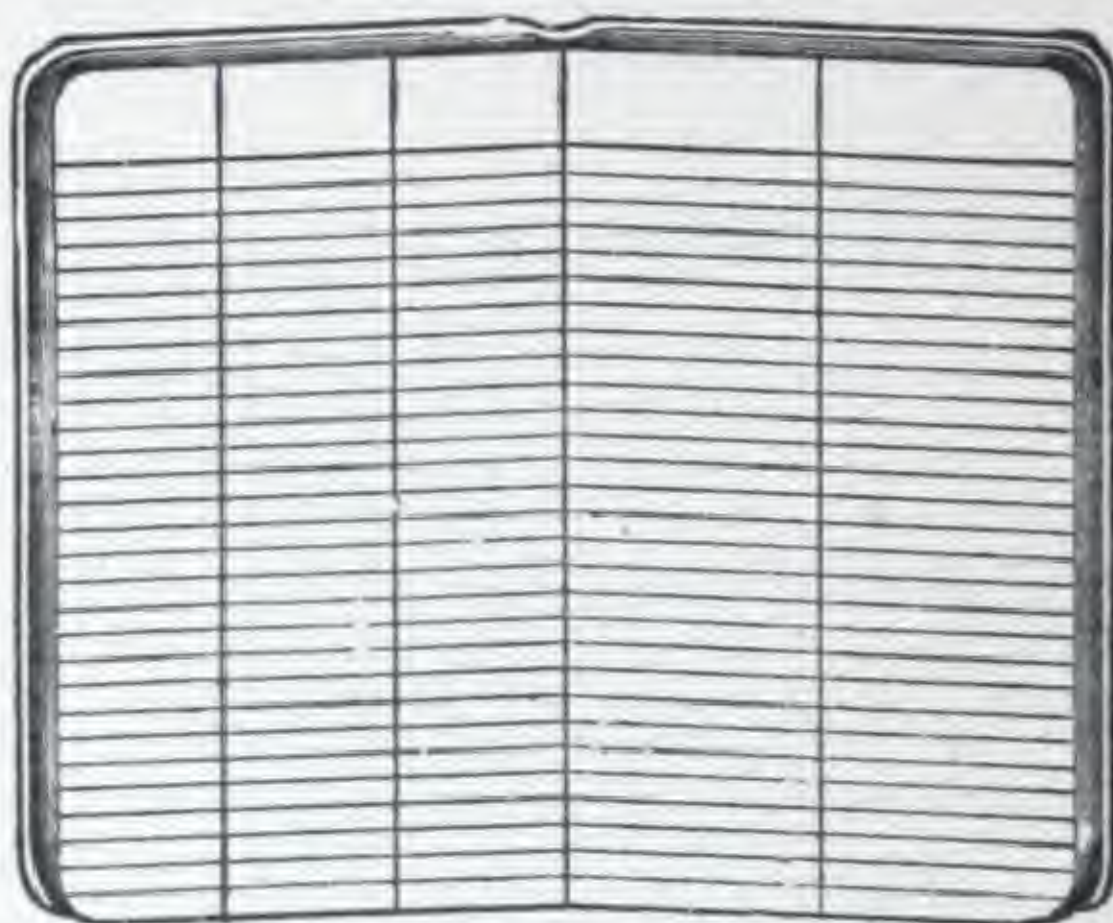
PER DOZ. EACH

- 42 Duplicating Field Book, with original leaf perforated,  $4\frac{1}{2} \times 7\frac{3}{4}$  inches, 80 leaves, smooth paper.....  
 42P Duplicating Field Book, with duplicate leaf perforated,  $4\frac{1}{2} \times 7\frac{3}{4}$  inches, 80 leaves, smooth paper.....  
 42½ Binders for Duplicating Field Books.....

For description of Nos. 742, 742P and 742½ see page 42

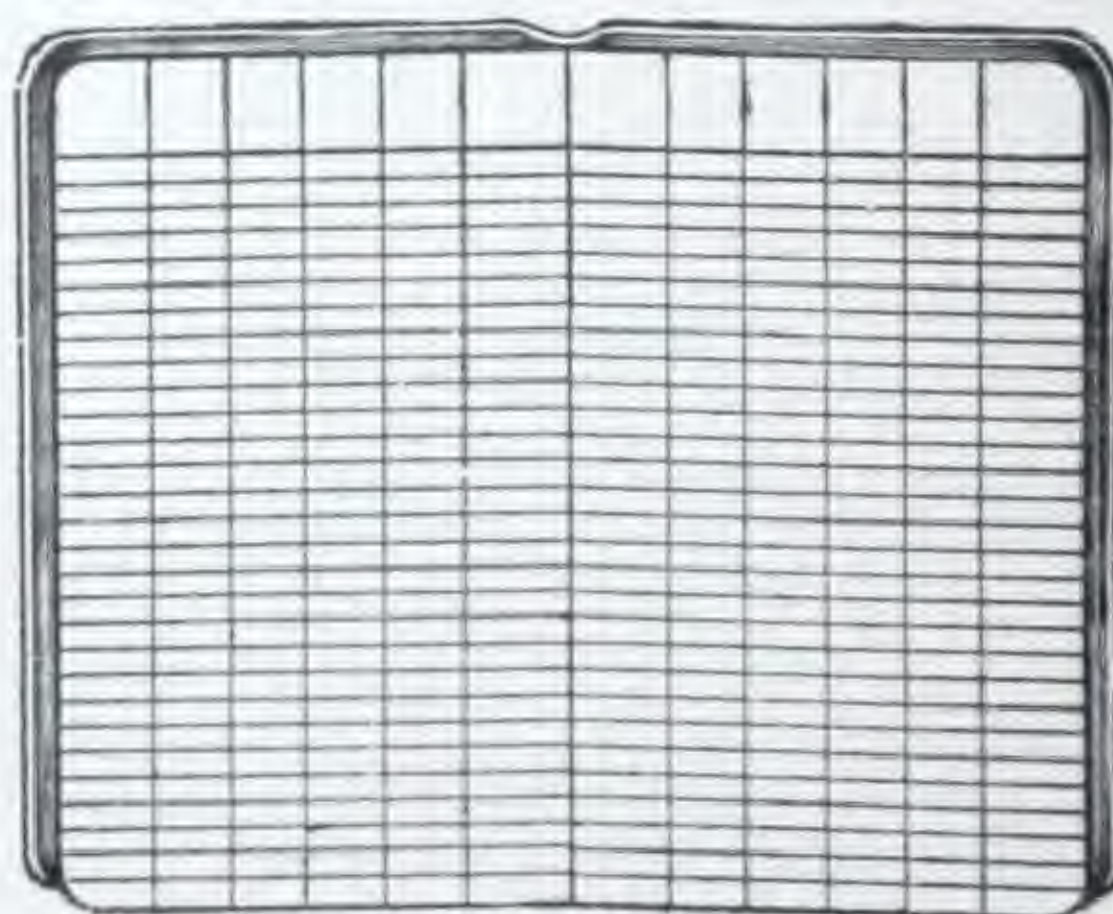


## ENGINEER'S FIELD BOOKS—Continued.



746

PER DOZ. EACH

746 Transit Book,  $4\frac{1}{2} \times 7\frac{1}{2}$ ", 80 leaves, smooth paper, with tables,747 Transit Book,  $4\frac{1}{2} \times 7\frac{1}{2}$ ", 60 leaves, smooth paper, with tables,

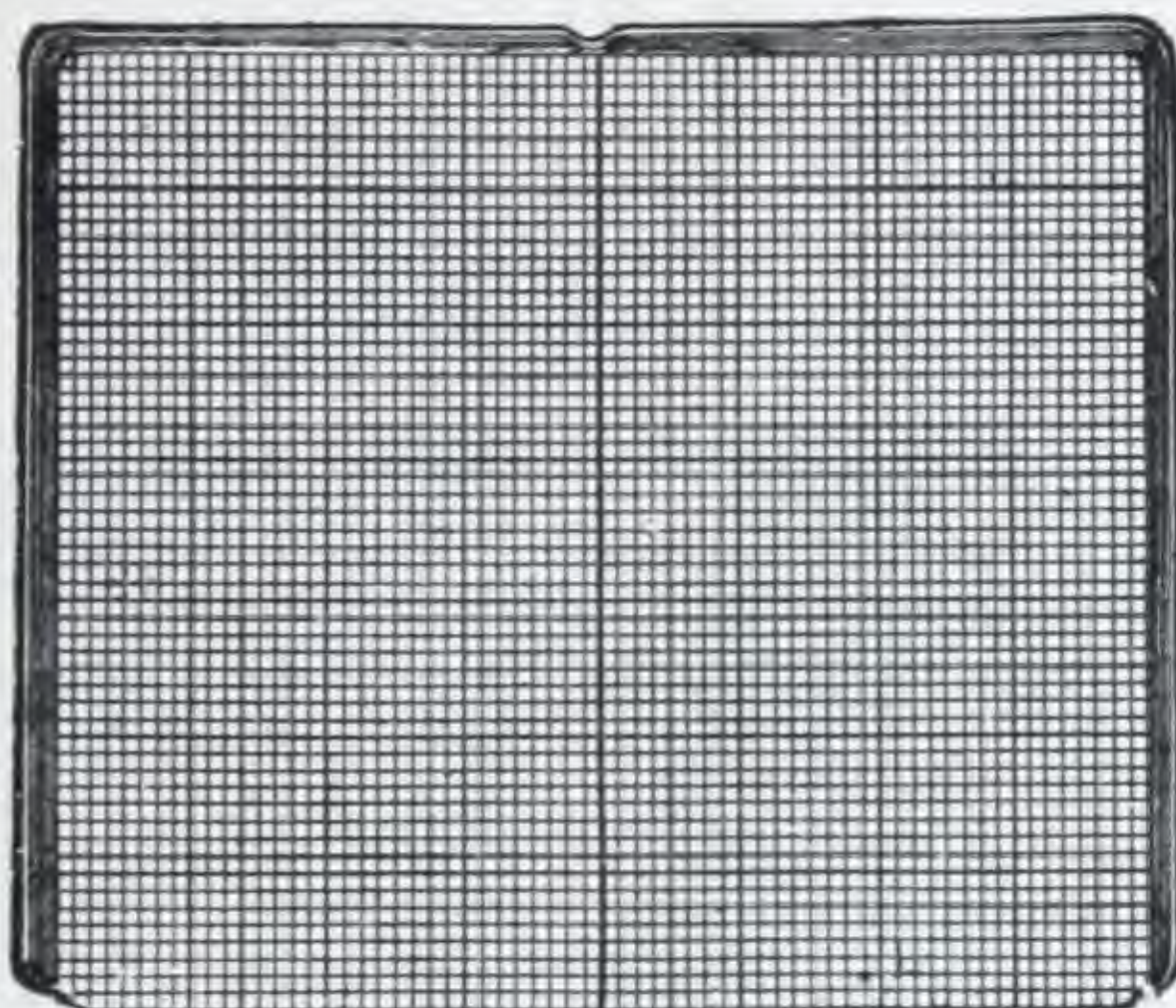
743

PER DOZ. EACH

743 Level Book,  $4 \times 6\frac{1}{2}$ ", 80 leaves, smooth paper.....744 Level Book,  $4 \times 6\frac{1}{2}$ ", 60 leaves, smooth paper.....

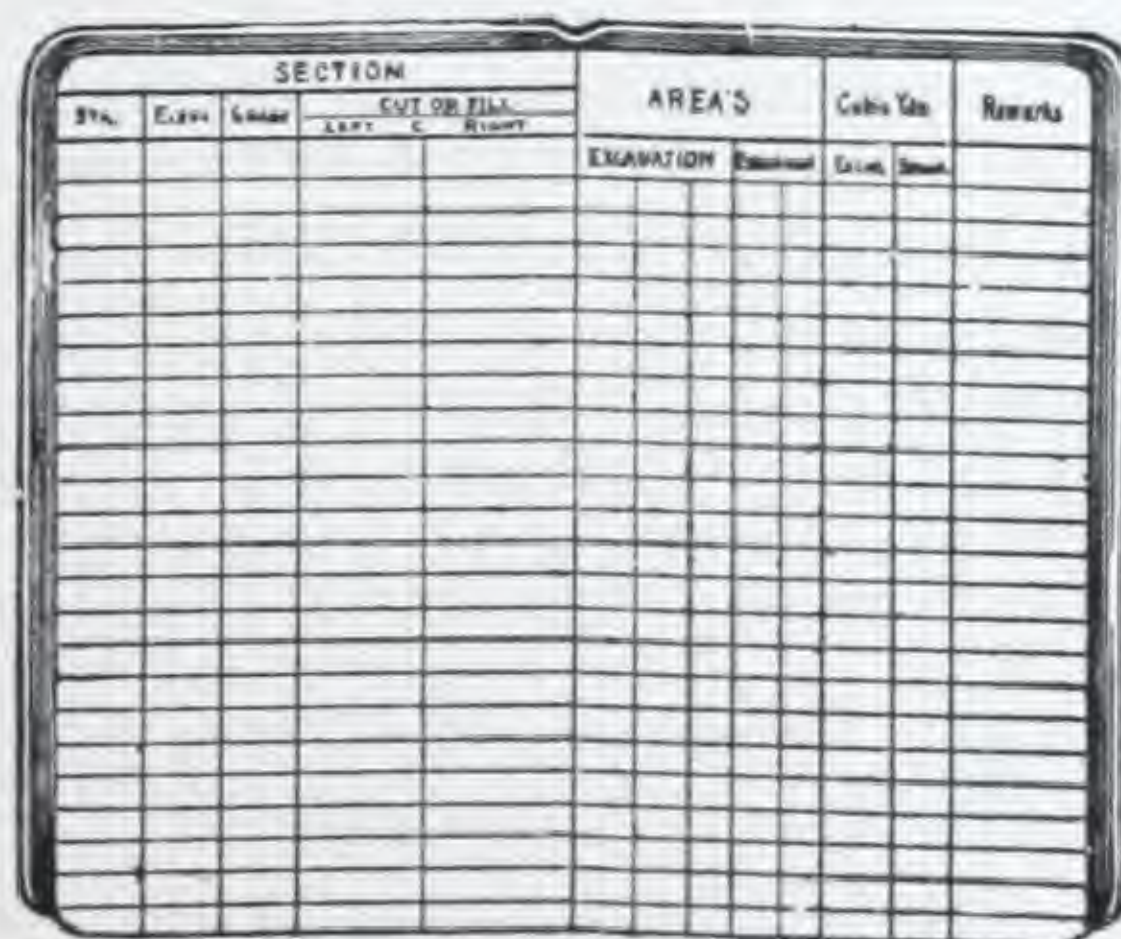


## ENGINEER'S FIELD BOOKS—Continued.



750

PER DOZ. EACH

750 Cross Section Book,  $4\frac{1}{2} \times 7\frac{1}{2}$ ", 80 leaves.....751 Cross Section Book,  $7 \times 8\frac{1}{4}$ ", 80 leaves.....

749

PER DOZ. EACH

749 Field Book,  $5 \times 7\frac{3}{4}$ ", 80 leaves, with printed heading and smooth paper.....

We make to order any other style of Field and Cross Section Books in lots of six dozen of one kind only.



## ENGINEERS LOOSE LEAF FIELD BOOKS



Our Engineers Loose Leaf Field Books are designed to meet the requirements of engineers working in the field, enabling them to send any of their notes to the office daily or weekly, and at the same time to continue using the books. They also permit of filing the notes of any particular survey together, and of filing notes of each survey in alphabetical order according to the names of clients.


The covers,  $4\frac{3}{4} \times 7\frac{1}{2}$  inches, are of fifty leaf capacity, have round corners, and are furnished in Black Morocco. The improved mechanism is very light and strong, composed of a narrow metal back with six rings, so arranged that they can be opened by one operation, permitting the leaves to be inserted or removed rapidly. When the book is open the leaves lie perfectly flat, and as the covers are very stiff the book can be held firmly and notes quickly entered and sketches rapidly made. The leaves are of the same high grade paper, with waterproof rulings, as furnished in our regular Engineers Field Books.

752	Loose-Leaf Cover only, Black Morocco binding.....	Each,
753	Loose Leaves, No. 740 ruling, 50 leaves in set.....	Set,
754	" " " 743 " 50 " " " .....	"
755	" " " 750 " 50 " " " .....	"
756	Transfer Binder for loose leaves.....	Each,



## DRAWING INSTRUMENTS

OUR line of Drawing Instruments shown on the following pages include all of the best known makes, and were selected with the view of giving our customers the best quality of goods at the lowest prices, and an inspection of our line and prices will convince the most exacting purchaser.

The "Richter" Instruments (or so-called "flat round" type) (pages 48 to 63) have gained a world-wide reputation for their true and accurate joints. Their unique form, coupled with the easy motion of the joint, enables users to easily spread the legs and make minute and accurate adjustments with one hand. There are no side screws to bother the user or interfere with the vision. All "Richter" Instruments are either stamped "Richter" or have the Richter trade mark .

The "Alteneder" line here shown (pages 64 to 79) will be found very complete; but should any other instruments made by T. Alteneder & Sons be desired, we will be pleased to quote special prices upon application.


The "Extra Fine" German Drawing Instruments (pages 80 to 93) have been carefully selected to suit the requirements of those desiring to purchase a thoroughly good instrument at a moderate price. These instruments are fitted with the pivot joint head and are fully guaranteed by us to be especially suitable for use in colleges and technical schools.

The "Fine" German Drawing Instruments (pages 94 to 100) are especially imported by us to supply the demand for a good drawing instrument at a low price. These goods are well made, and for school use are highly recommended. We invite an inspection of these goods before purchasing elsewhere.



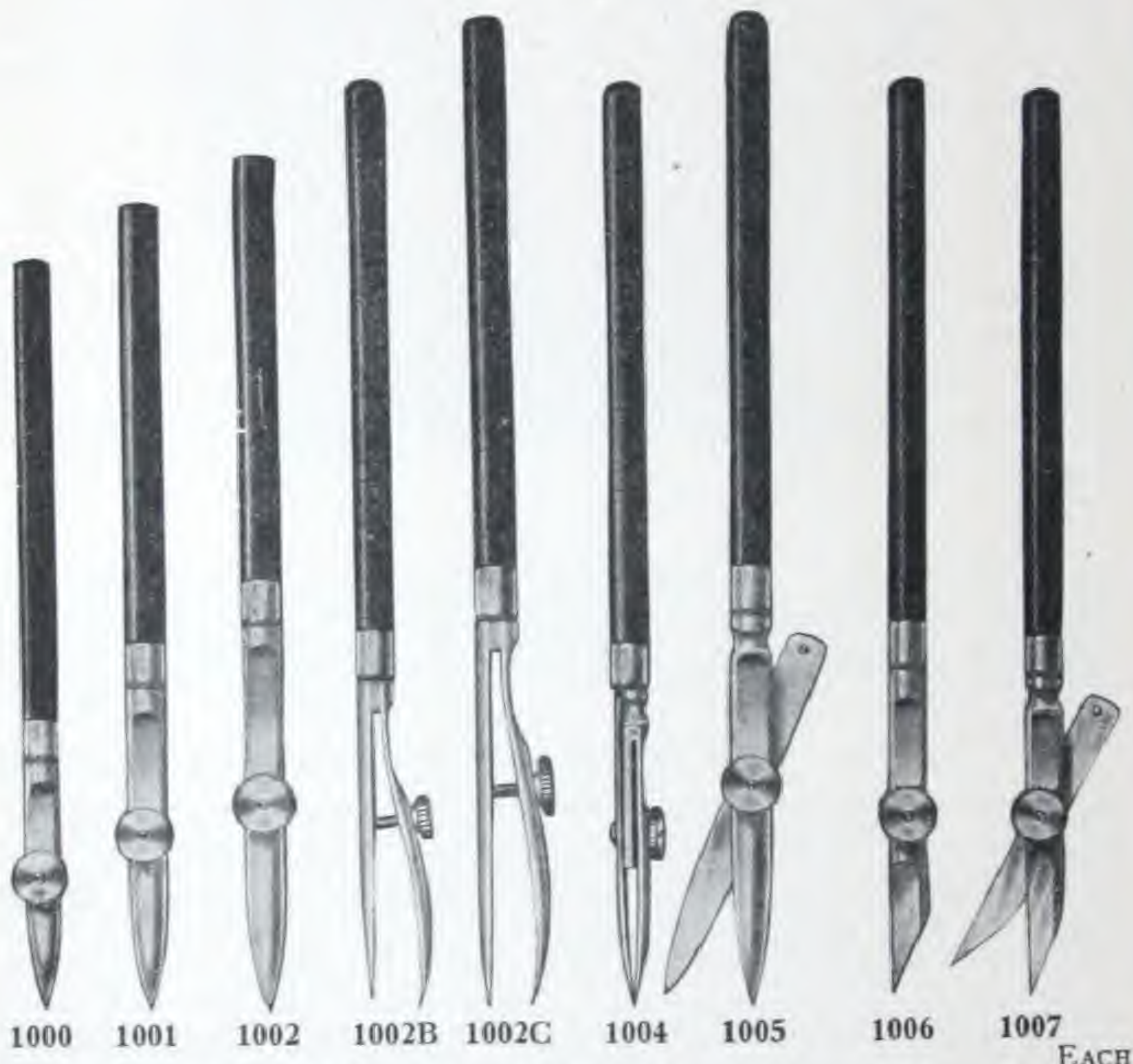
# RICHTER'S INSTRUMENTS OF PRECISION OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH TOOL STEEL

The Highest Grade of Instruments

Each Instrument Stamped Richter or 

For description, see page 47

Illustration  $\frac{3}{4}$  size



1000	Ruling Pen, 4½ inches, metal handle.....	
1001	Ruling Pen, 5 inches, metal handle.....	
1002	Ruling Pen, 5½ inches, metal handle.....	
1002A	Ruling Pen, 4½ inches, "Extra Quality," metal handle.....	
1002B	Ruling Pen, 5 inches, "Extra Quality," metal handle.....	
1002C	Ruling Pen, 5½ inches, "Extra Quality," metal handle.....	
1003	Ruling Pen, 4½ inches, metal handle, with cross joint.....	
1004	Ruling Pen, 5 inches, metal handle, with cross joint.....	
1005	Ruling Pen, 5½ inches, metal handle, with cross joint.....	
1006	Ruling Pen, 5 inches, metal handle, for fine lines.....	
1007	Ruling Pen, 5 inches, metal handle, for fine lines with cross joint.....	


Ruling Pens with cross joint are so constructed that the blades may be easily separated and thoroughly cleaned, without disturbing the adjusting screw, thereby preserving the original adjustment.



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

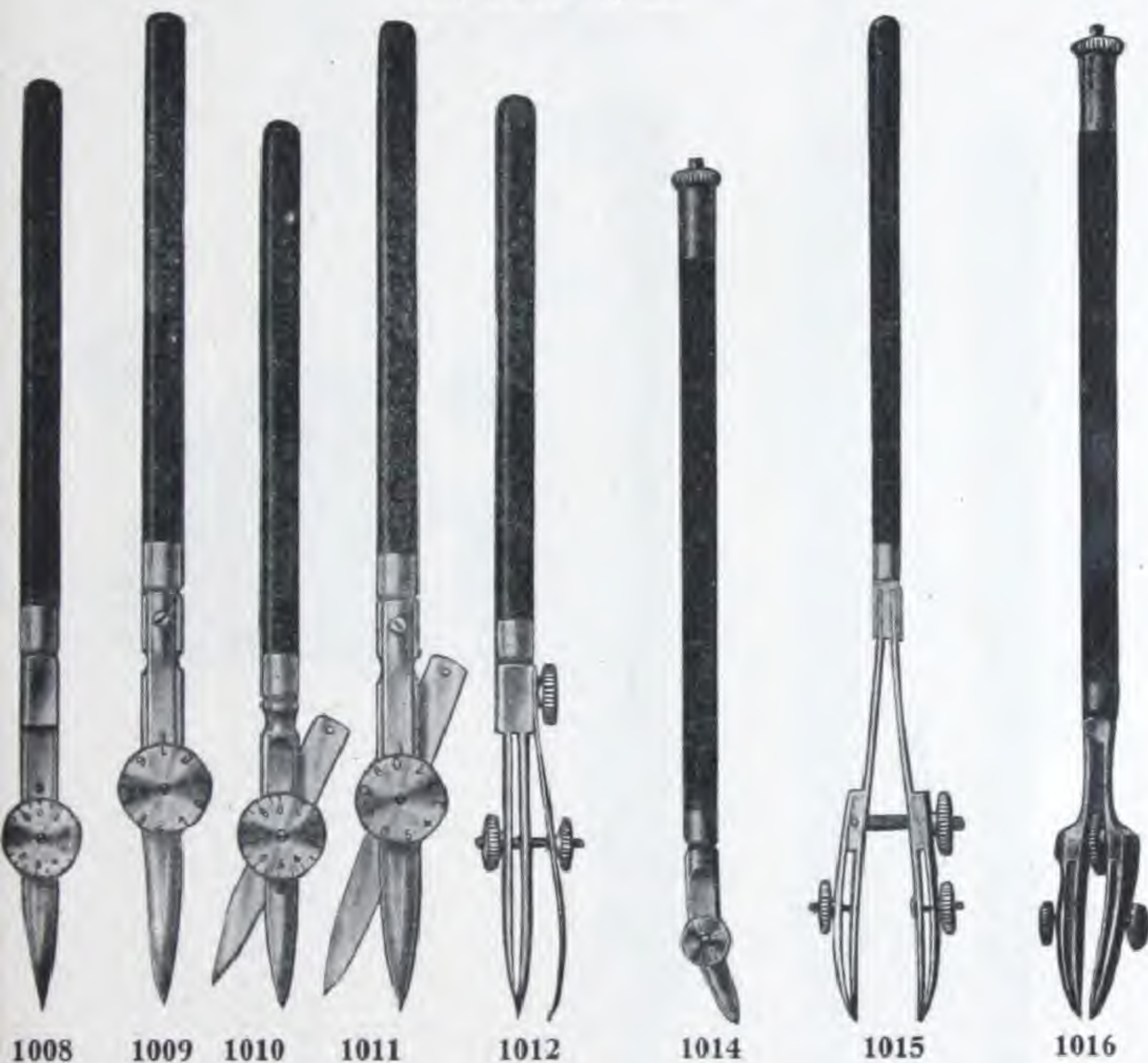
OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH  
TOOL STEEL

The Highest Grade of Instruments

Each Instrument Stamped Richter or 

For Description, see page 47

Illustrations  $\frac{2}{3}$  size




EACH

- 1008 Ruling Pen, 5 inches, graduated thumb screw, aluminum handle....  
 1009 Ruling Pen, 5½ inches, graduated thumb screw, aluminum handle..  
 1010 Ruling Pen, 5 inches, graduated thumb screw and cross joint,  
 aluminum handle.....  
 1011 Ruling Pen, 5½ inches, graduated thumb screw and cross joint,  
 aluminum handle.....  
 1012 Cross Hatching Pen, 5 inches, third blade, by means of which cross  
 hatching can be easily done and the lines minutely regulated,  
 with aluminum handle.....  
 1014 Curve Pen, 4½ inches, aluminum handle, blades fastened to a rod in  
 a hollow handle, with screw at upper end to set firm for straight  
 lines or loose to follow curves.....  
 1015 Railroad Pen, 5¼ inches, aluminum handle.....  
 1016 Double Curve Pen, 5¼ inches, aluminum handle.....



RICHTER'S INSTRUMENTS OF PRECISION—Continued.

OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH  
TOOL STEEL

Each Instrument Stamped Richter or 

Illustrations  $\frac{2}{3}$  size.



1018



1019



1021




1022

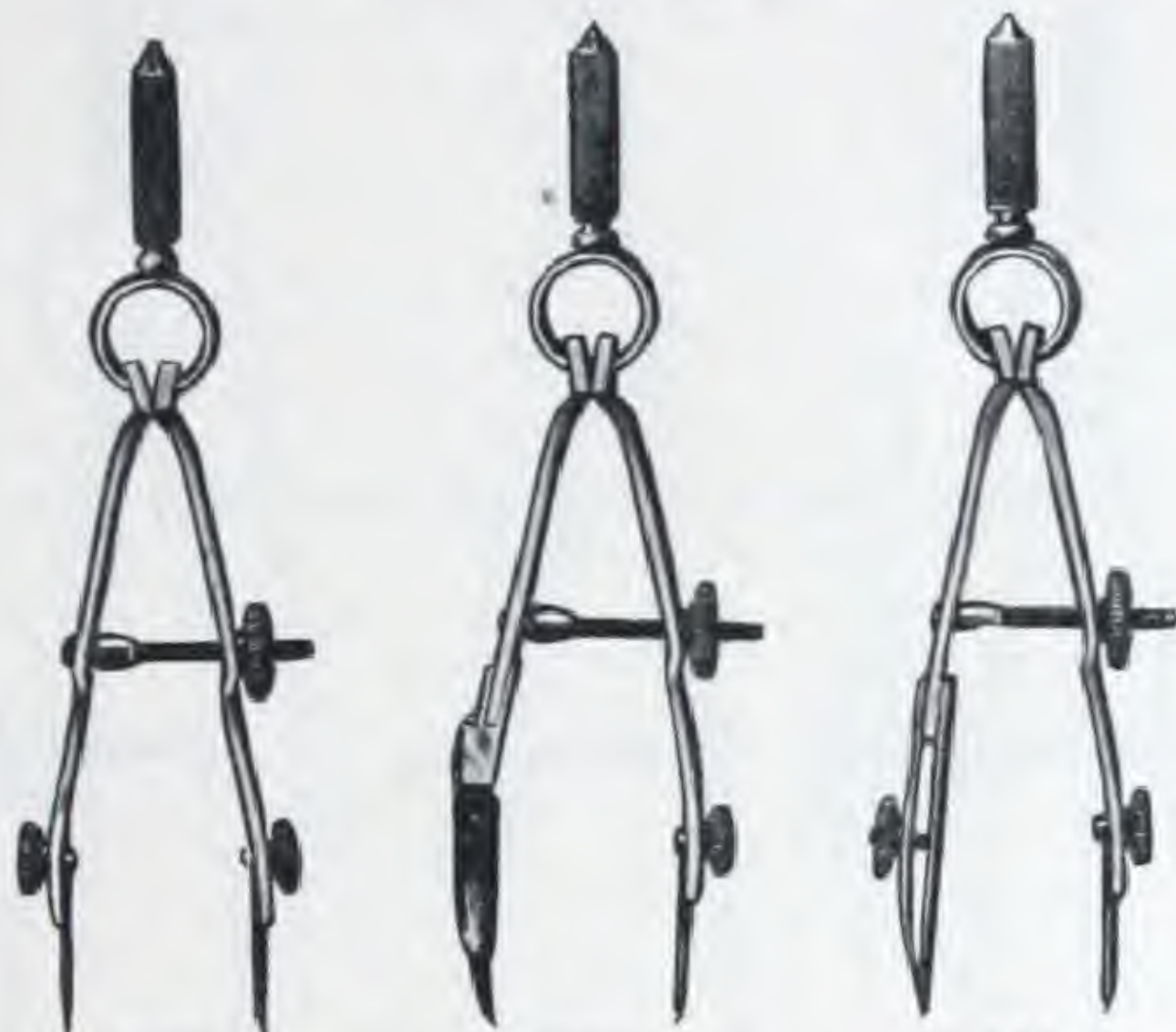
EACH

- 1018 Swedish Ruling Pen, 6 inches, flat ebony handle, .....
- 1019 Swedish Ruling Pen, 6 inches, flat aluminum handle .....
- 1020 Swedish Ruling Pen, 6 inches, flat ebony handle .....
- 1021 Swedish Ruling Pen, 6 inches, flat aluminum handle .....
- 1022 Dotting Instrument, with three wheels, in case .....



**RICHTER'S INSTRUMENTS OF PRECISION—Continued.  
OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH  
TOOL STEEL**

Each Instrument Stamped Richter or   
Illustrations  $\frac{2}{3}$  size



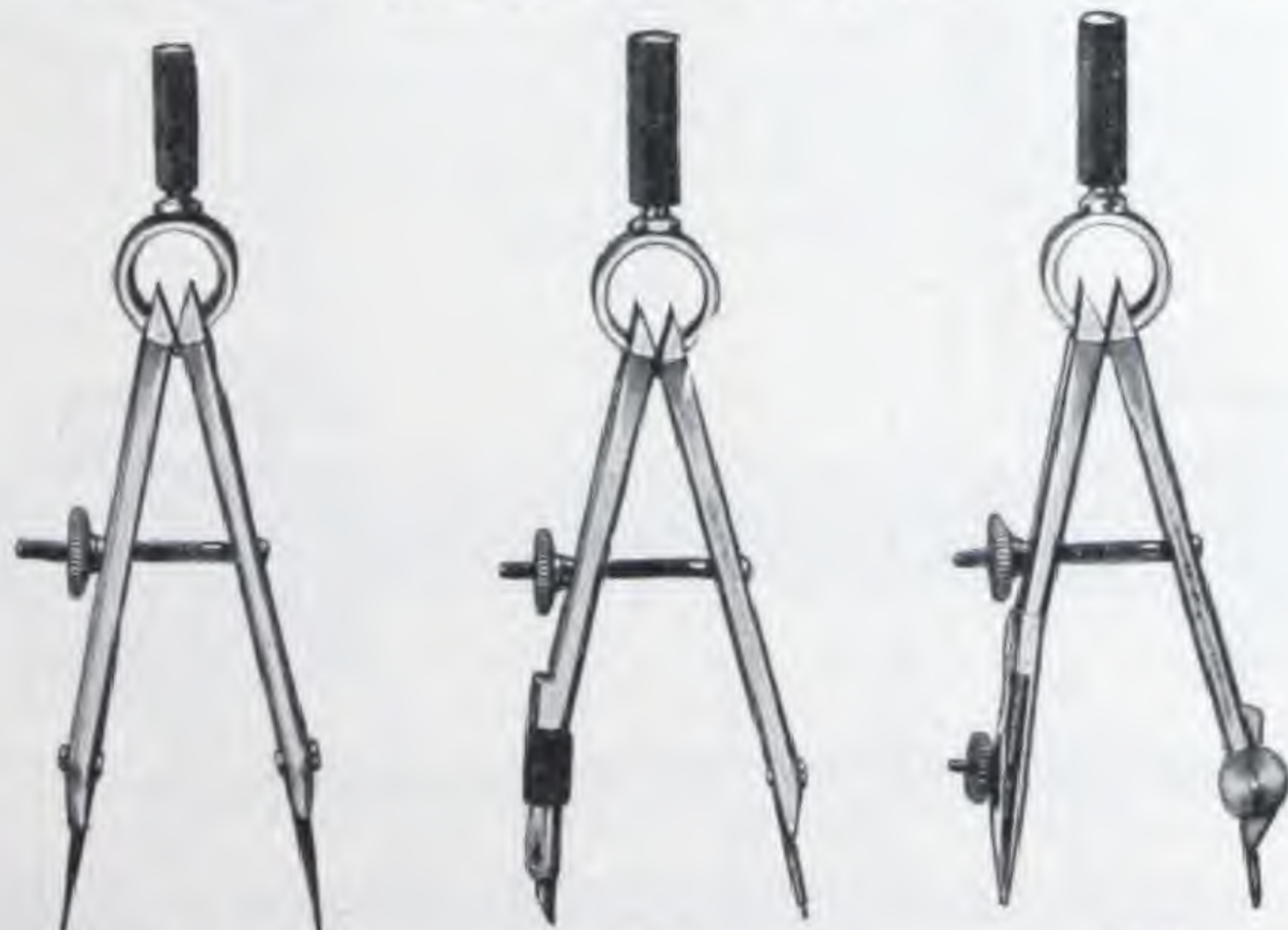
1033

1034

1035

EACH

- 1033 Circular Steel Spring Bow Dividers,  $3\frac{1}{2}$  inches, metal handle.....  
1034 Circular Steel Spring Bow Pencil,  $3\frac{1}{2}$  inches, metal handle.....  
1035 Circular Steel Spring Bow Pen,  $3\frac{1}{2}$  inches, metal handle.....  
1037 Set of bows, Nos. 1033, 1034, 1035, in case, per set.....



520

522


524

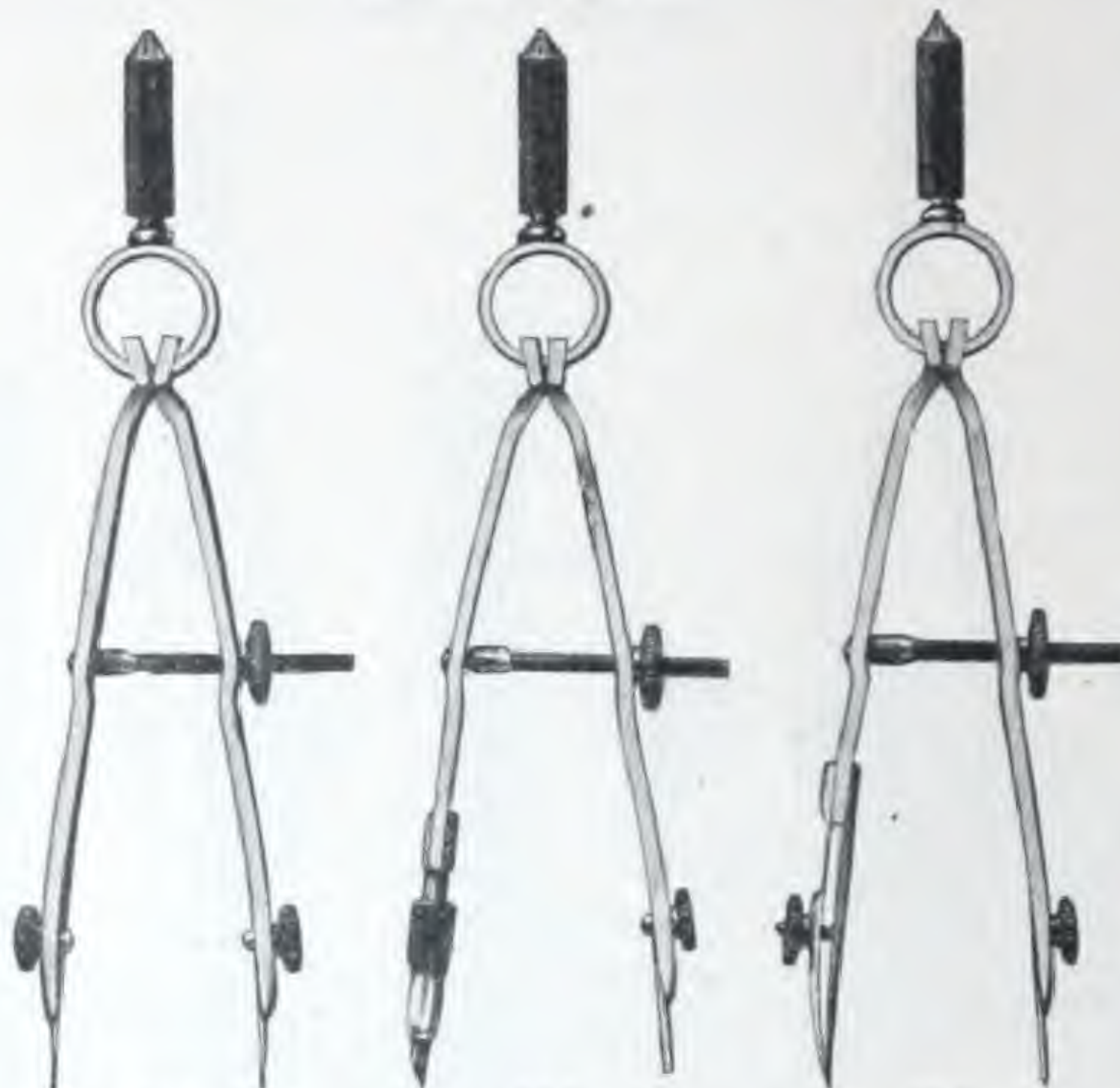
EACH

- 520 German Silver Bow Dividers,  $3\frac{1}{2}$  inches, metal handle.....  
522 German Silver Bow Pencil,  $3\frac{1}{2}$  inches, metal handle.....  
524 German Silver Bow Pen,  $3\frac{1}{2}$  inches, metal handle.....  
525 Set German Silver Bows, Nos. 520, 522, 524, in case.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

Each Instrument Stamped Richter or   
Illustrations  $\frac{2}{3}$  size.



510

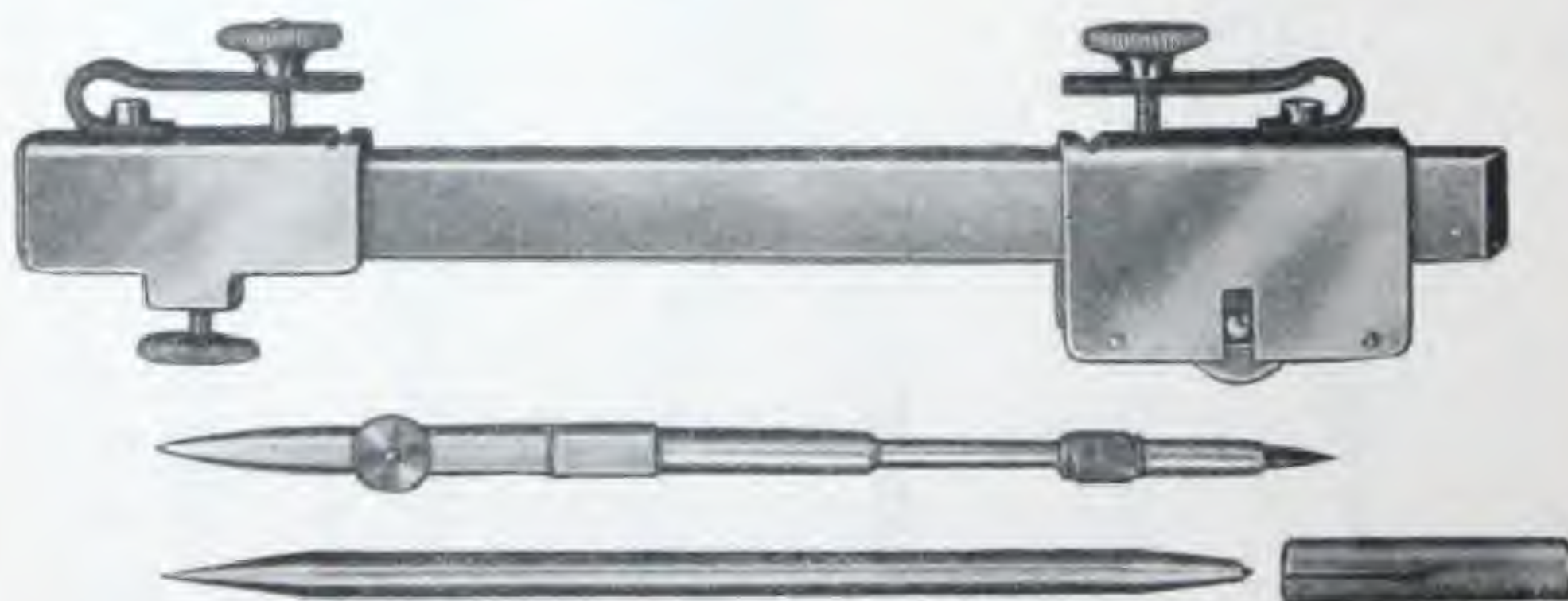
512

514

EACH

- 510 German Silver Bow Divider,  $4\frac{1}{4}$  inches, metal handle. ....  
 512 German Silver Bow Pencil,  $4\frac{1}{4}$  inches, metal handle. ....  
 514 German Silver Bow Pen,  $4\frac{1}{4}$  inches, metal handle. ....  
 515 Set German Silver Bows, Nos. 510, 512, 514, in case. ....

## BEAM COMPASS



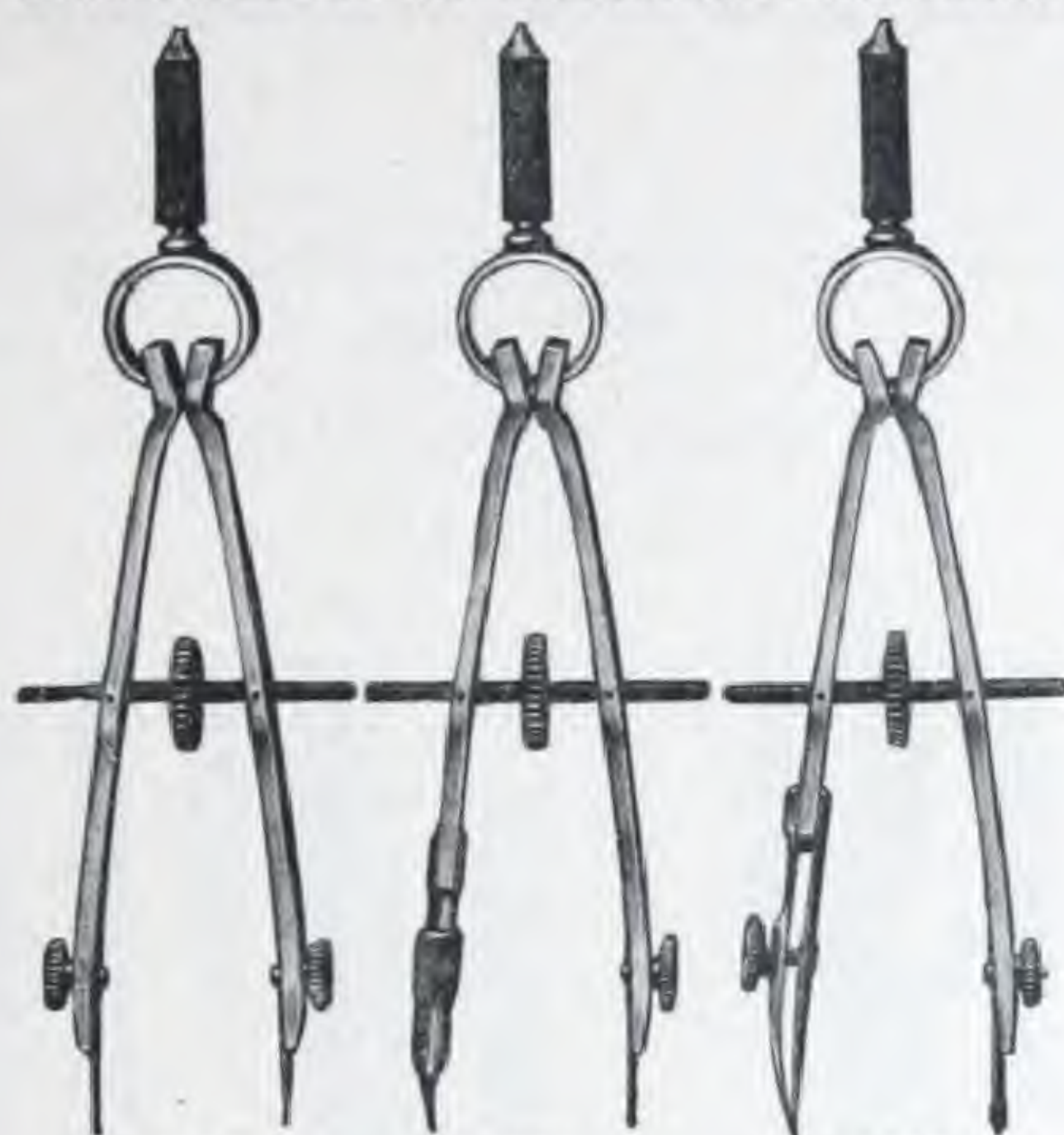
620

EACH

- 620 Beam Compass in case. ....  
 620A Wooden Bar, machine divided to  $\frac{1}{16}$  inch, 20 inches long. ....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

Illustration  
 $\frac{2}{3}$  size.

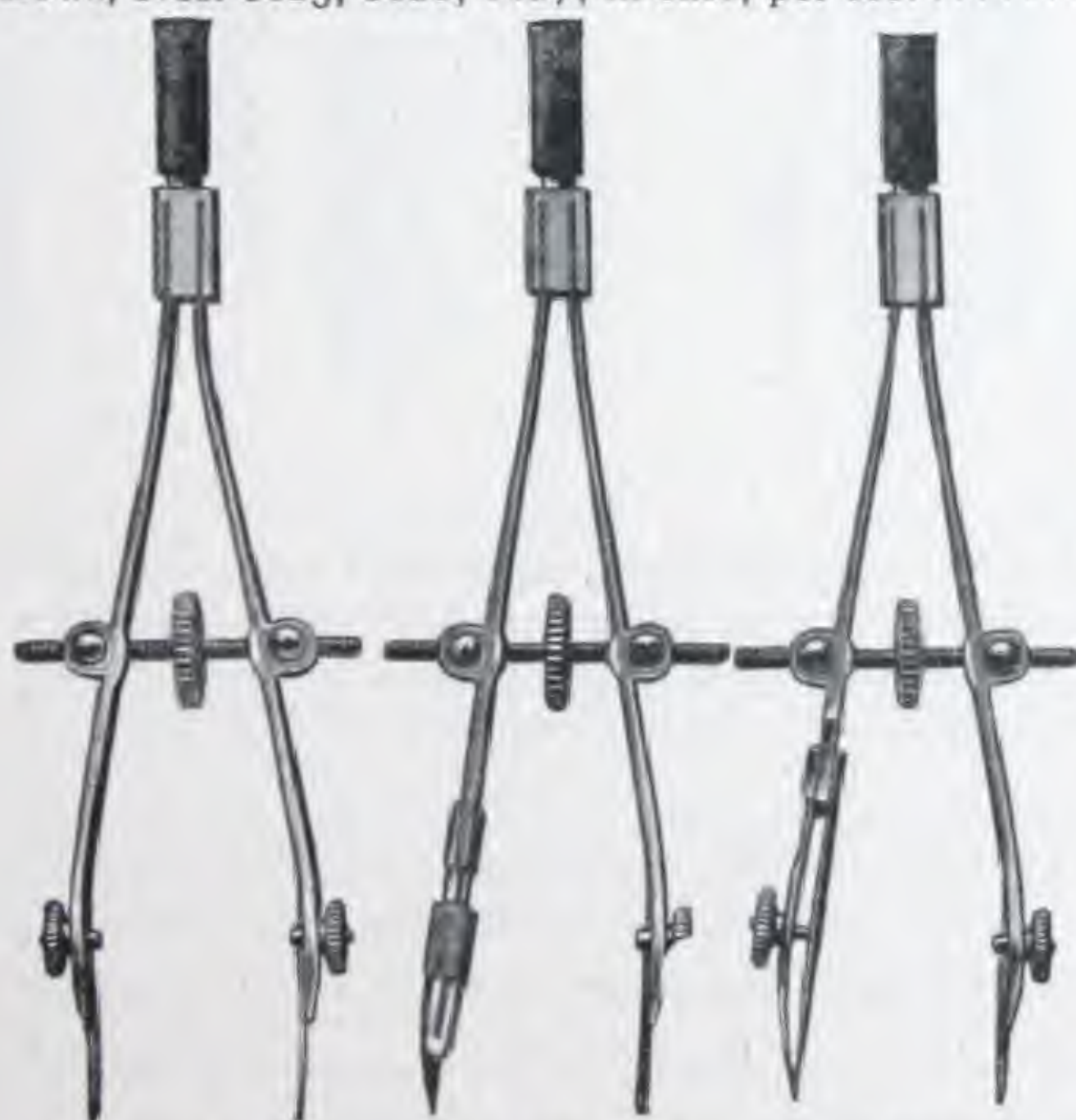
1025

1026

1027

EACH

- 1025 German Silver Spring Bow Dividers,  $4\frac{1}{4}$  inches, metal handle.....  
 1026 German Silver Spring Bow Pencil,  $4\frac{1}{4}$  inches, metal handle.....  
 1027 German Silver Spring Bow Pen,  $4\frac{1}{4}$  inches, metal handle.....  
 1028 Set of Bows, Nos. 1025, 1026, 1027, in case, per set.....

Illustration  
 $\frac{2}{3}$  size.

1029

1030

1031


EACH

- 1029 Steel Spring Bow Dividers,  $4\frac{1}{4}$  inches, metal handle.....  
 1030 Steel Spring Bow Pencil,  $4\frac{1}{4}$  inches, metal handle.....  
 1031 Steel Spring Bow Pen,  $4\frac{1}{4}$  inches, metal handle.....  
 1032 Set of Bows, Nos. 1029, 1030, 1031, in case, per set.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH  
TOOL STEEL

Each Instrument Stamped Richter or 

Illustrations  $\frac{2}{3}$  size



1042



1044

EACH


- 1042** German Silver Interchangeable Spring Bow Compass, 4 inches, with pen and pencil points, lead box and handle to hold reserve needle points. The pen and pencil points can be used as ruling pen and pencil, respectively, by inserting them into the handle in case....
- 1044** Steel Interchangeable Spring Bow Compass, 4 inches, with pen and pencil points, lead box and handle to hold reserve needle points. The pen and pencil points can be used as ruling pen and pencil, respectively, by inserting them into the handle, in the case.....

These combination instruments can be arranged to cover all ordinary work when the diameter of circle is four inches or less.



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH  
TOOL STEEL

Each instrument Stamped Richter or 

Illustrations  $\frac{2}{3}$  size.



1047 (Closed)



1046 (Closed)



1048 (Open)


IN CASE

- 1045 Drop Single Spring Bow Pen,  $4\frac{1}{2}$ -inch, with self-adjusting point for very small circles.....
- 1046 Drop Single Spring Bow Pen,  $4\frac{1}{2}$ -inch, with self-adjusting point for very small circles, and with pencil part.....
- 1047 Drop Double Spring Bow Pen,  $4\frac{1}{2}$ -inch, with self-adjusting point for very small circles.....
- 1048 Drop Double Spring Bow Pen,  $4\frac{1}{2}$ -inch, with self-adjusting point for very small circles, and with pencil part.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH  
TOOL STEEL

Each Instrument Stamped Richter or 

Illustrations  $\frac{2}{3}$  size.



1051



1052



1055



1072



1071



1069

EACH


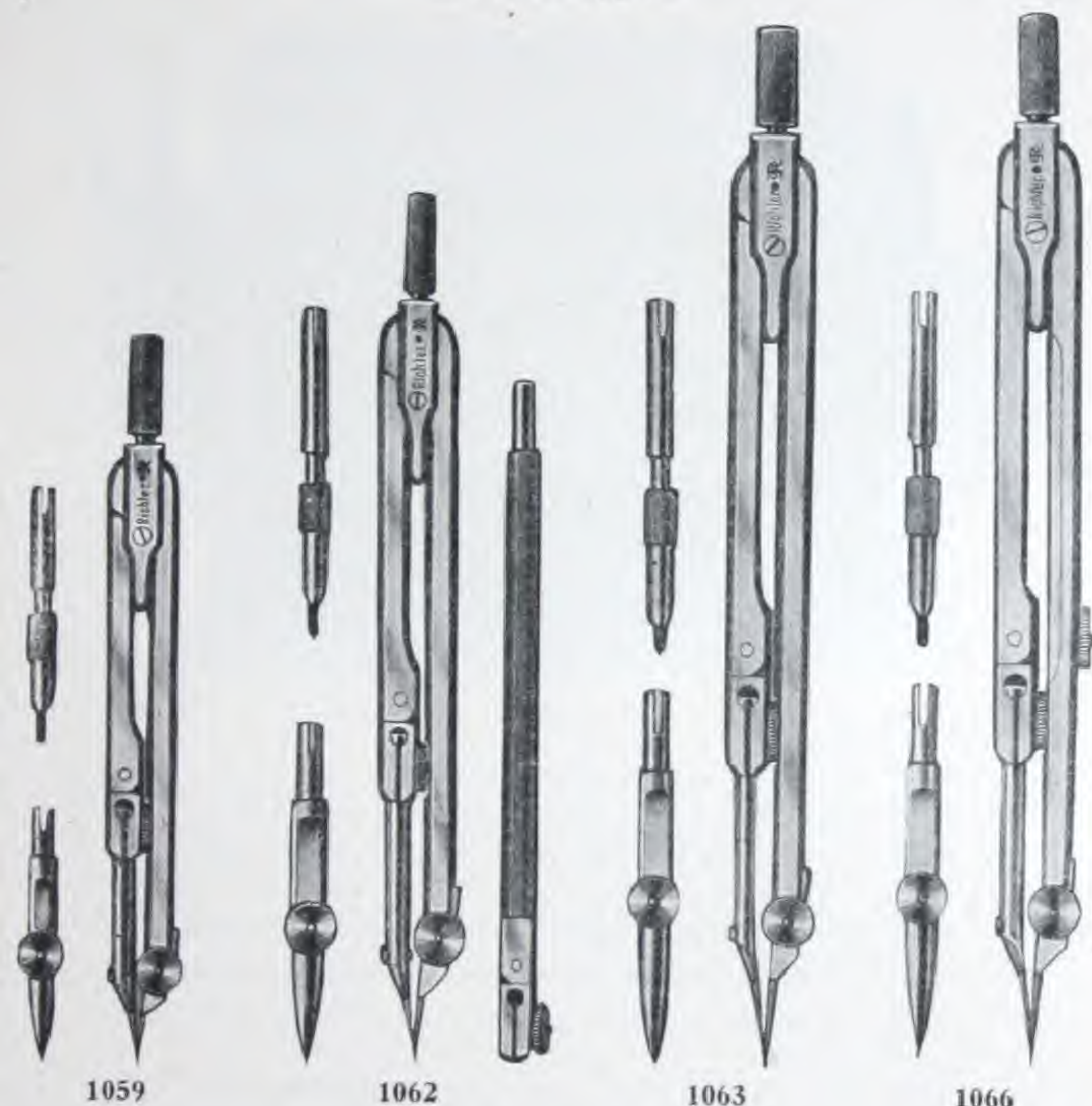
- 1051 Plain Dividers, 4 inches, with replaceable steel points.....  
 1052 Plain Dividers, 5  $\frac{3}{4}$  inches, with replaceable steel points.....  
 1053 Plain Dividers, 6  $\frac{1}{2}$  inches, with replaceable steel points.....  
 1054 Hairspring Dividers, 4 inches, with replaceable steel points.....  
 1055 Hairspring Dividers, 5  $\frac{3}{4}$  inches, with replaceable steel points.....  
 1056 Hairspring Dividers, 6  $\frac{1}{2}$  inches, with replaceable steel points.....  
 1069 Combination Key and Lead Box.....  
 1071 Metal Handle, 2  $\frac{1}{2}$  inches, holding 4 needle points.....  
 1072 Metal Handle, 3 inches, holding 4 needle points.....

Dividers Nos. 1051 to 1056 have Straightening Device



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

## OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH TOOL STEEL

Each Instrument Stamped Richter or Illustrations  $\frac{2}{3}$  size.

1059

1062

1063

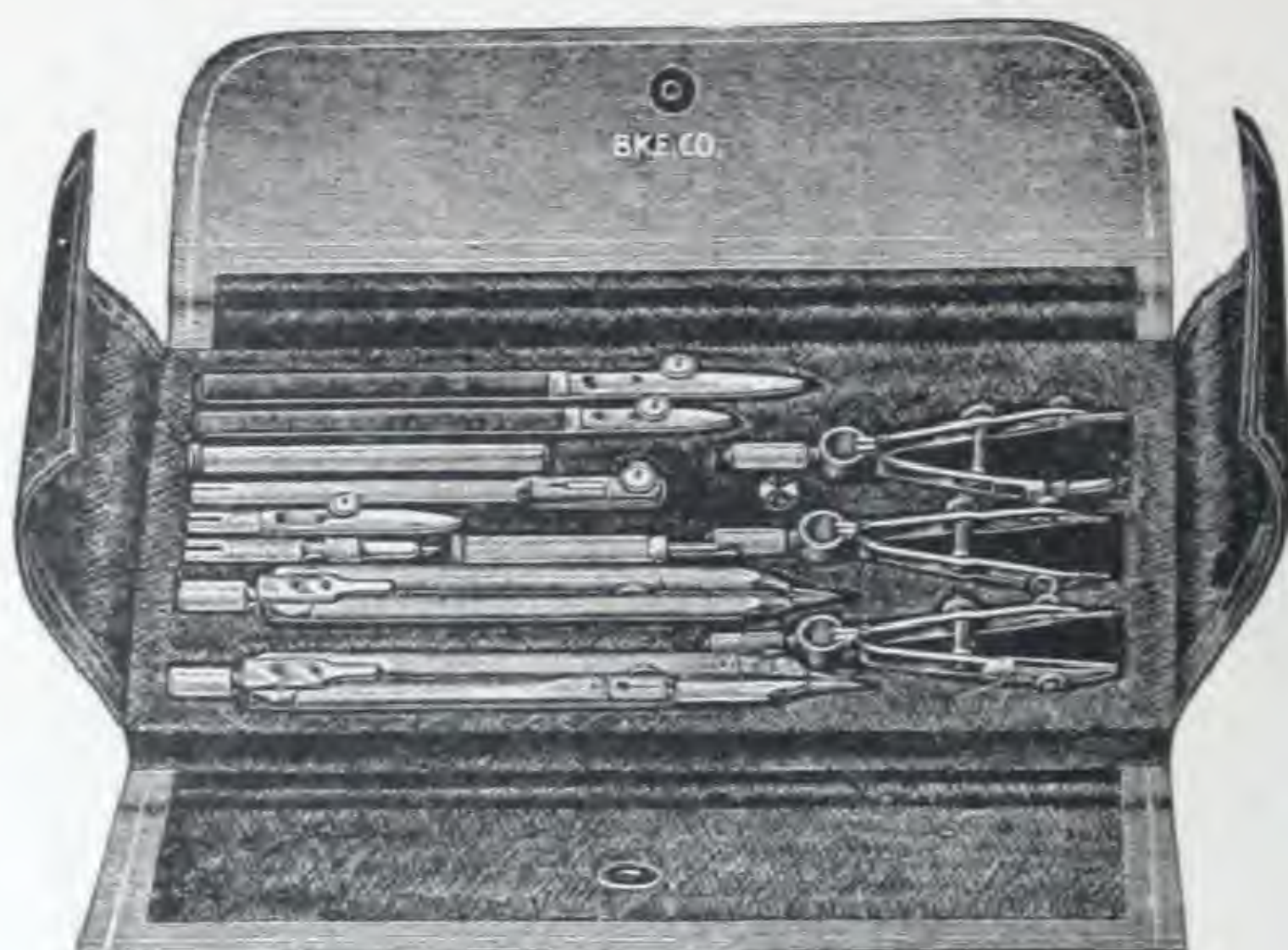

1066

EACH

- 1059 Compasses, 4 inches, with replaceable needle points, pen and pencil points, straightening device, key and lead box.....
- 1060 Compasses, 4 inches, like No. 1059, but with cross-joint pen.....
- 1061 Compasses, 4 inches, **hairspring**, with replaceable needle points, pen and pencil points and lengthening bar, straightening device, key and lead box.....
- 1062 Compass, 5 inches, with replaceable needle points, pen and pencil points, and lengthening bar, straightening device, key and lead box.....
- 1063 Compasses, 6 inches, with replaceable needle points, pen and pencil points and lengthening bar, straightening device, key and lead box.....
- 1064 Compasses, 6 inches, like No. 1063, but with cross-joint pen.....
- 1065 Compasses, 7 inches, otherwise same as No. 1063.....
- 1066 Compasses, 6 inches, **hairspring**, with replaceable needle points, pen and pencil points and lengthening bar, straightening device, key and lead box.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

Each Instrument Stamped Richter or 

1086

## 1086 Containing:

- 1000 Ruling Pen,  $4\frac{1}{2}$  inches, metal handle.
- 1002 Ruling Pen,  $5\frac{1}{2}$  inches, metal handle.
- 1033 Circular Steel Spring Bow Dividers,  $3\frac{1}{2}$  inches, metal handle.
- 1034 Circular Steel Spring Bow Pencil,  $3\frac{1}{2}$  inches, metal handle.
- 1035 Circular Steel Spring Bow Pen,  $3\frac{1}{2}$  inches, metal handle.
- 1055 Hairspring Dividers,  $5\frac{3}{4}$  inches, with replaceable steel points.
- 1063 Compasses, 6 inches, with replaceable needle points, pen and pencil points, lengthening bar and straightening device.
- 1069 Combination Key and Lead Box.
- Center Tack,  $\frac{3}{8}$ -inch diameter.
- 1071 Metal Handle, 3 inches, with four needle points.

Per set.....

- 1087 Containing the same as No. 1086, but with Hairspring Compasses No. 1066 in place of No. 1063.

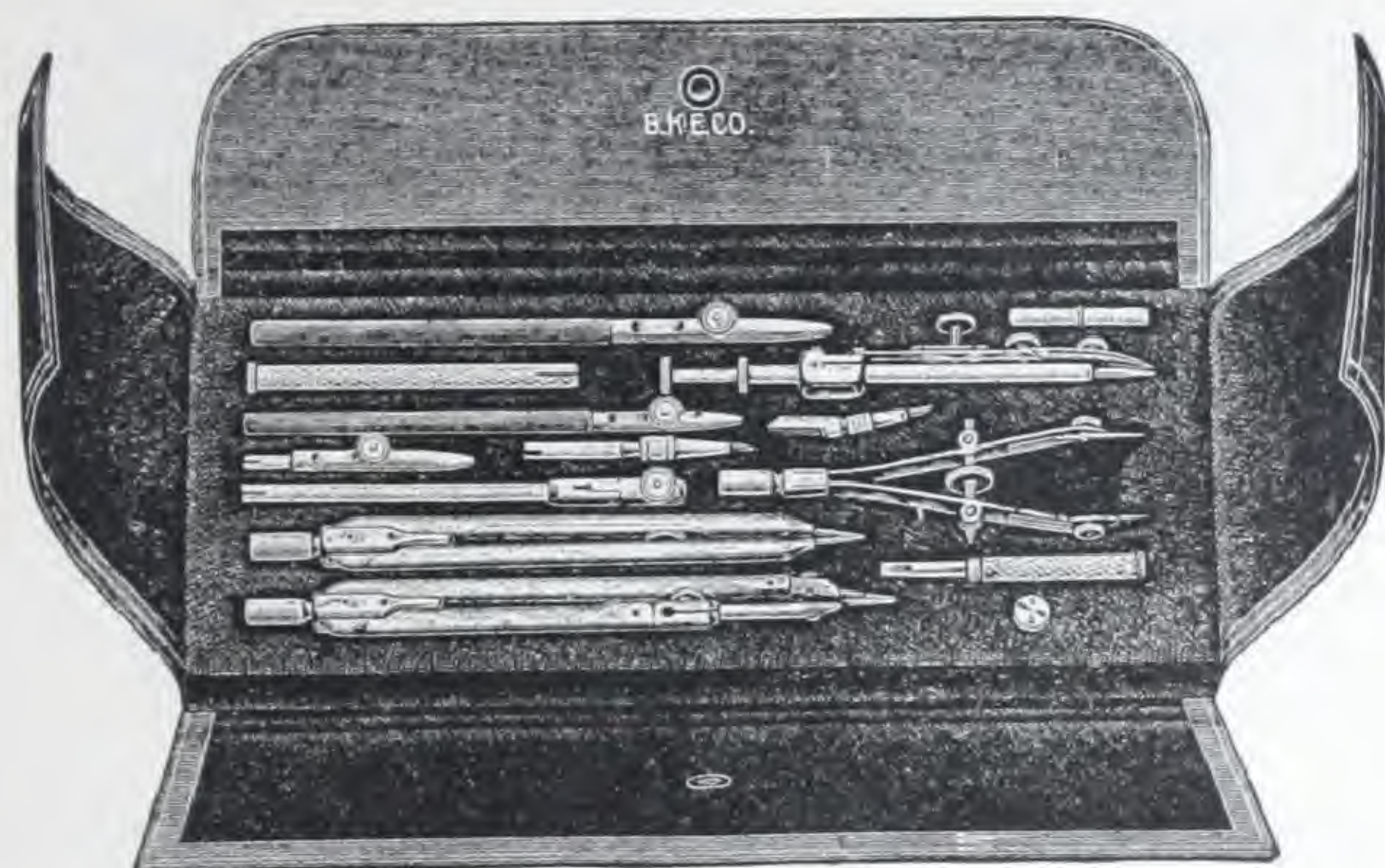

Per set.....

- 1088 Containing the same as No. 1086, but with  $4\frac{1}{4}$ -inch Bows, Nos. 510, 512, 514, in place of Nos. 1033, 1034, 1035.

Per set.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

Each Instrument Stamped Richter or 

1082

**1082** Containing:

- 1000** Ruling Pen,  $4\frac{1}{2}$  inches, metal handle.
- 1002** Ruling Pen,  $5\frac{1}{2}$  inches, metal handle.
- 1029** Steel Spring Bow Dividers,  $4\frac{1}{4}$  inches, metal handle.
- 1046** Self-Adjusting Spring Bow Pen, with pencil point,  $4\frac{1}{2}$  inches.
- 1052** Hairspring Dividers,  $5\frac{3}{4}$  inches, with replaceable steel points.
- 1063** Compasses, 6 inches, with replaceable needle points, pen and pencil points, lengthening bar and straightening device.
- 1069** Combination Key and Lead Box.
- Center Tack,  $\frac{3}{8}$ -inch diameter.
- 1071** Metal Handle, 3 inches, with four needle points.


Per set.....

- 1083** Containing the same as No. 1082, but with the addition of No. 1059  
Compasses, 4 inches.

Per set.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

Each Instrument Stamped Richter or 



1092

**1092** Containing: No. 1052 Hairspring Divider,  $5\frac{3}{4}$  inches, straightening device.

No. 1063 Compasses, 6 inches, straightening device, pen and pencil points, lengthening bar, combination key and lead box and metal handle holding four reserve needle points.

No. 520 Spring Bow Spacer,  $3\frac{1}{2}$  inches, metal handle.

No. 522 Spring Bow Pencil,  $3\frac{1}{2}$  inches, metal handle.

No. 524 Spring Bow Pen,  $3\frac{1}{2}$  inches, metal handle.

No. 1001 Ruling Pen, 5 inches, spring blade.

No. 1002 Ruling Pen,  $5\frac{1}{2}$  inches, spring blade.

PER SET

In Pocket Book Case.....

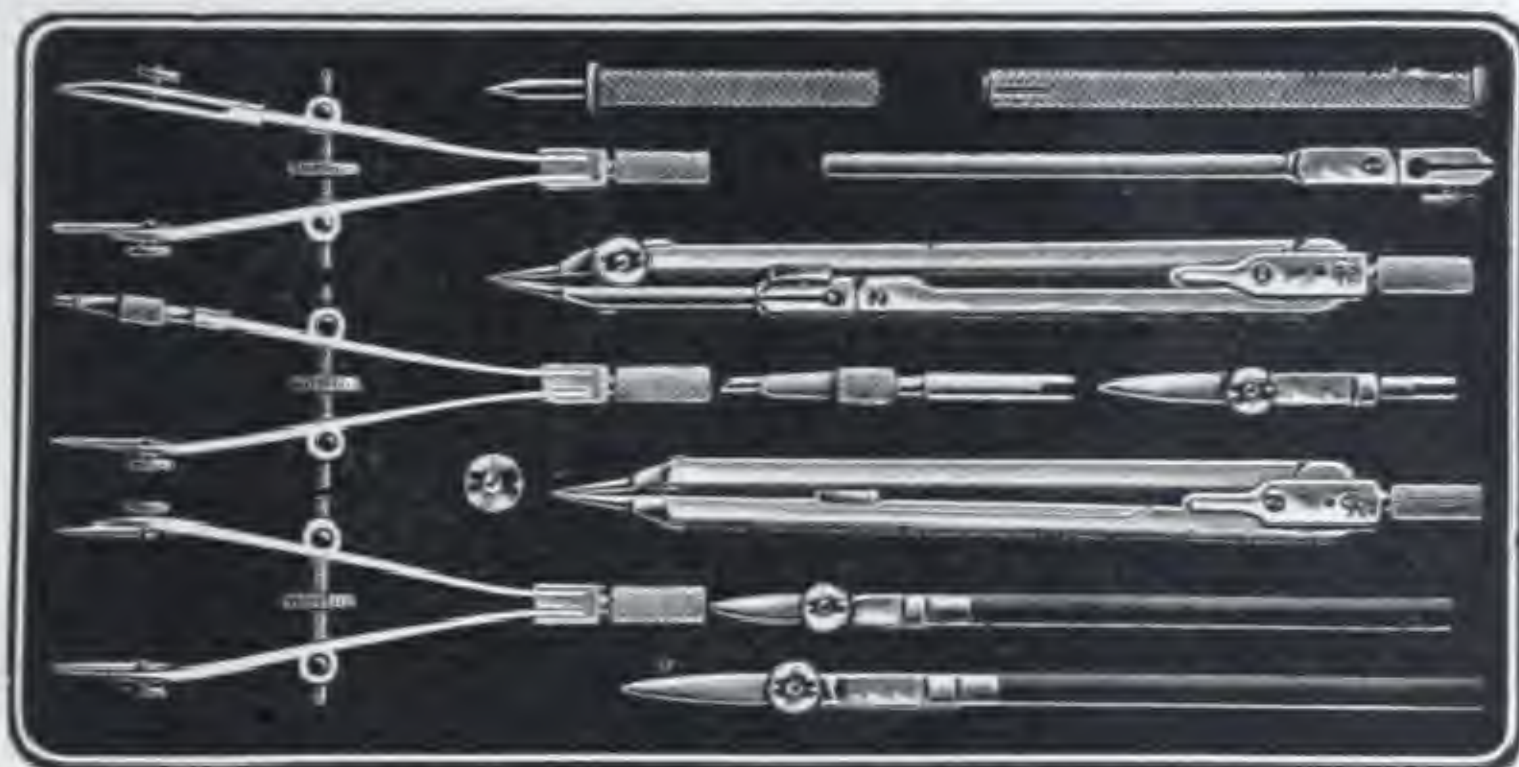

**1092A** Contents same as No. 1092, but No. 1066 Hairspring Compasses in place of No. 1063.

PER SET

In Pocket Book Case.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

Each Instrument Stamped Richter or 

1093

- 1093** Containing: No. 1055 Hairspring Divider,  $5\frac{3}{4}$  inches, straightening device.  
 No. 1063 Compasses, 6 inches, straightening device, with pen and pencil points, lengthening bar, combination key and lead box and metal handle holding four reserve needle points.  
 No. 1029 Spring Bow Spacer,  $4\frac{1}{4}$  inches, metal handle.  
 No. 1030 Spring Bow Pencil,  $4\frac{1}{4}$  inches, metal handle.  
 No. 1031 Spring Bow Pen,  $4\frac{1}{4}$  inches, metal handle.  
 No. 1001 Ruling Pen, 5 inches, spring blade.  
 No. 1002 Ruling Pen,  $5\frac{1}{2}$  inches, spring blade.

PER SET

In Pocketbook Case.....

- 1093A** Contents same as No. 1093, but No. 1066 Hairspring Compasses in place of No. 1063.

PER SET

In Pocketbook Case.....

- 1093B** Set No. 1093 with  $4\frac{1}{4}$ -inch Bows Nos. 1025, 1026 and 1027 in place of Nos. 1029, 1030 and 1031.

PER SET

In Pocketbook Case.....


- 1093C** Set No. 1093B with No. 1066 Hairspring Compasses in place of No. 1063.

PER SET

In Pocketbook Case.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.


Each Instrument Stamped Richter or 

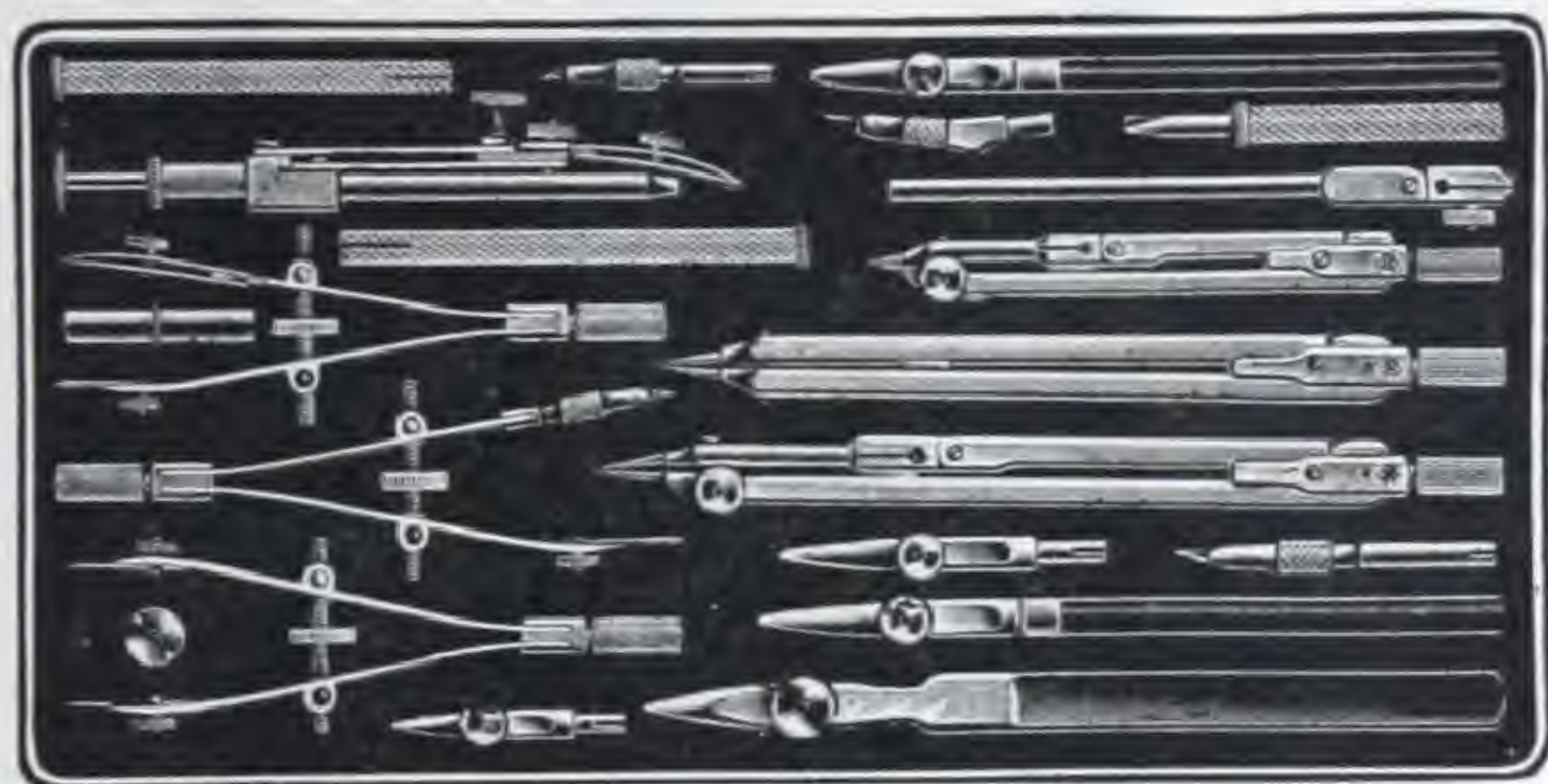
1094

- 1094** Containing: No. 1052 Hairspring Divider,  $5\frac{3}{4}$  inches, straightening device.  
 No. 1059 Compasses, 4 inches, straightening device, with pen and pencil points and metal handle holding four reserve needle points.  
 No. 1063 Compasses, 6 inches, straightening device, with pen and pencil points, lengthening bar, combination key and lead box and metal handle holding four reserve needle points.  
 No. 520 Spring Bow Spacer,  $3\frac{1}{2}$  inches, metal handle.  
 No. 522 Spring Bow Pencil,  $3\frac{1}{2}$  inches, metal handle.  
 No. 524 Spring Bow Pen,  $3\frac{1}{2}$  inches, metal handle.  
 No. 1001 Ruling Pen, 5 inches, spring blade.  
 No. 1019 Ruling Pen, Swedish pattern, flat aluminum handle. PER SET
- In Pocketbook Case.....
- 1094A** Contents same as No. 1094, but No. 1066 Hairspring Compasses in place of No. 1063. PER SET
- In Pocketbook Case.....
- 1094B** Set No. 1094 with  $3\frac{1}{2}$ -inch Bows Nos. 1033, 1034 and 1035 in place of Nos. 520, 522, 524. PER SET
- In Pocketbook Case.....
- 1094C** Same set with No. 1066 Hairspring Compasses in place of No. 1063. PER SET
- In Pocketbook Case.....



## RICHTER'S INSTRUMENTS OF PRECISION—Continued.

Each Instrument Stamped Richter or 

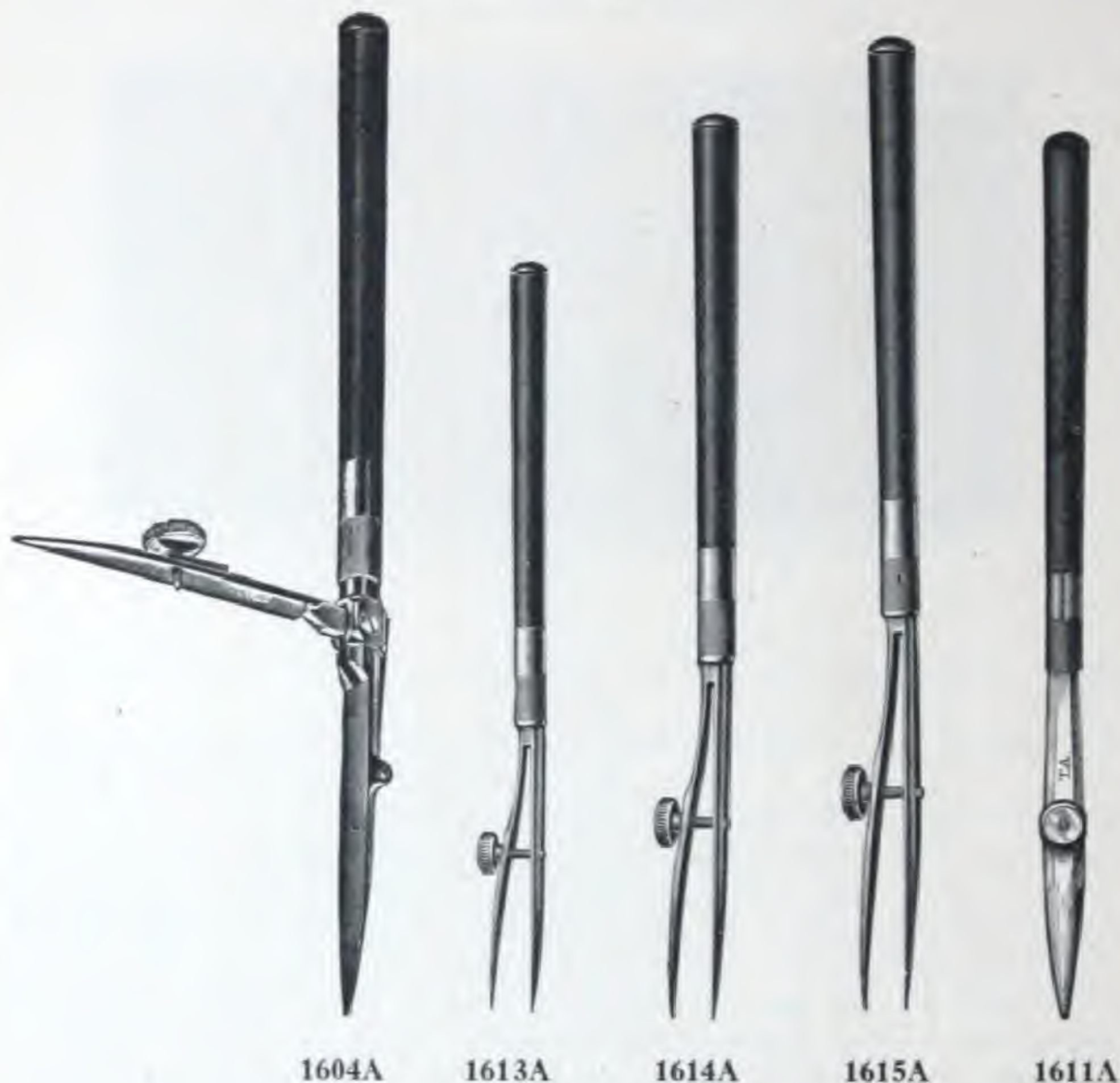


1095

- 1095** Containing: No. 1052 Hairspring Divider,  $5\frac{3}{4}$  inches, straightening device.  
 No. 1059 Compasses, 4 inches, straightening device, pen and pencil points, and metal handle holding four reserve needle points.  
 No. 1063 Compasses, 6 inches, straightening device, pen and pencil points, lengthening bar, combination key and lead box, and metal handle holding four reserve needle points.  
 No. 1029 Spring Bow Spacer,  $4\frac{1}{4}$  inches, metal handle.  
 No. 1030 Spring Bow Pencil,  $4\frac{1}{4}$  inches, metal handle.  
 No. 1031 Spring Bow Pen,  $4\frac{1}{4}$  inches, metal handle.  
 No. 1047 Rotating Compasses,  $4\frac{1}{2}$  inches, with pen and pencil points.  
 No. 1001 Ruling Pen, 5 inches, spring blade.  
 No. 1002 Ruling Pen,  $5\frac{1}{2}$  inches, spring blade.  
 No. 1019 Ruling Pen, Swedish pattern, flat aluminum handle. PER SET  
 In Pocketbook Case.....
- 1095A** Contents same as No. 1095, but No. 1066 Hairspring Compasses in place of No. 1063. PER SET  
 In Pocketbook Case.....
- 1095B** Set No. 1095 with  $4\frac{1}{4}$ -inch Bows Nos. 1025, 1026 and 1027 in place of Nos. 1029, 1030 and 1031. PER SET  
 In Pocketbook Case.....
- 1095C** Same set with No. 1066 Hairspring Compasses in place of No. 1063. PER SET  
 In Pocketbook Case.....



## ALTENEDER DRAWING INSTRUMENTS

Illustrations  $\frac{2}{3}$  Size

1604A

1613A

1614A

1615A

1611A

EACH

- 1600A 4 $\frac{1}{4}$ -inch Spring Hinge Ruling Pen, ebony handle.....  
 1602A 5 -inch Spring Hinge Ruling Pen, ebony handle.....  
 1604A 5 $\frac{1}{2}$ -inch Spring Hinge Ruling Pen, ebony handle.....  
 1610A 4 $\frac{1}{4}$ -inch Plain Ruling Pen, ebony handle.....  
 1611A 5 -inch Plain Ruling Pen, ebony handle.....  
 1612A 5 $\frac{1}{2}$ -inch Plain Ruling Pen, ebony handle.....  
 1613A 4 $\frac{1}{4}$ -inch Improved Ruling Pen, spring on upper blade, ebony handle.....  
 1614A 5 -inch Improved Ruling Pen, spring on upper blade, ebony handle.....  
 1615A 5 $\frac{1}{2}$ -inch Improved Ruling Pen, spring on upper blade, ebony handle.....

Graduated Screw will be furnished with any of above pens at small additional price.

Pens furnished with aluminum handle if preferred at small additional price.



## ALTENER DRAWING INSTRUMENTS—Continued.



- EACH
- 1630A 5-inch, wide blade Ruling Pen, spring on upper blade, ebony handle.....
- 1632A 6-inch, wide blade Ruling Pen, spring on upper blade, ebony handle.....
- 1634A 7-inch, wide blade Ruling Pen, spring on upper blade, ebony handle.....
- 1645A 4 3/4-inch Swivel Curve Pen, spring on upper blade, hollow metal handle.....
- 1650A 3 1/2-inch Pricker, screw cap, fixed needle point, ebony handle.....
- 1653A 4 1/2-inch Pricker, removable needle point, ebony handle.....

Nos. 1650A and 1653A furnished with aluminum handles at same price as with ebony handles.

Nos. 1630A, 1632A and 1634A, with aluminum handles instead of ebony, at an additional price.



## ALTENEDER DRAWING INSTRUMENTS—Continued.

Each Instrument is stamped with the trade-mark "T. A."

Illustrations  $\frac{2}{3}$  size.



1623A



1624A



1625A

- 1623A 5-inch Railroad Pen, ebony handle.....  
 1624A 5-inch Railroad Pencil, ebony handle.....  
 1625A 5-inch Railroad Pen, center adjustment, ebony handle.....

Furnished with aluminum handle at an additional price.



ALTENEDER DRAWING INSTRUMENTS—Continued.  
Illustrations  $\frac{2}{3}$  Size.



1510A



1514A



1516A

- 1510A Minute Bow Spacer,  $2\frac{1}{4}$  inches, metal handle.....
- 1514A Minute Bow Pencil,  $2\frac{1}{4}$  inches, adjustable needle point, metal handle.....
- 1516A Minute Bow Pen,  $2\frac{1}{4}$  inches, adjustable needle point, spring on upper blade of pen, metal handle.....
- 1517A Imitation Morocco Covered Case for three bow instruments....
- 1518A Real Morocco Covered Case for three bow instruments.....
- 1520A  $2\frac{3}{4}$ -inch Bow Spacer, metal handle.....
- 1521A  $2\frac{3}{4}$ -inch Bow Spacer, with adjustable needle points, metal handle.....
- 1522A  $2\frac{3}{4}$ -inch Bow Pencil, adjustable needle point, metal handle.....
- 1523A  $2\frac{3}{4}$ -inch Bow Pen, adjustable needle point, metal handle.....
- 1525A  $2\frac{3}{4}$ -inch Bow Pen, adjustable needle point, spring on upper blade of pen, metal handle.....
- 1527A Imitation Morocco Covered Case for three bow instruments....
- 1528A Real Morocco Covered Case for three bow instruments.....



1530A



1532A



1535A

- 1530A  $3\frac{1}{4}$ -inch Bow Spacer, metal handle.....
- 1531A  $3\frac{1}{4}$ -inch Bow Spacer, with adjustable needle points, metal handle.....
- 1532A  $3\frac{1}{4}$ -inch Bow Pencil, adjustable needle point, metal handle.....
- 1533A  $3\frac{1}{4}$ -inch Bow Pen, adjustable needle point, metal handle.....
- 1535A  $3\frac{1}{4}$ -inch Bow Pen, adjustable needle point, spring on upper blade of pen, metal handle.....
- 1537A Imitation Morocco Covered Case for three bow instruments....
- 1538A Real Morocco Covered Case for three bow instruments.....



## ALTENER DRAWING INSTRUMENTS—Continued.

Illustrations  $\frac{3}{8}$  size.

1580A



1582A



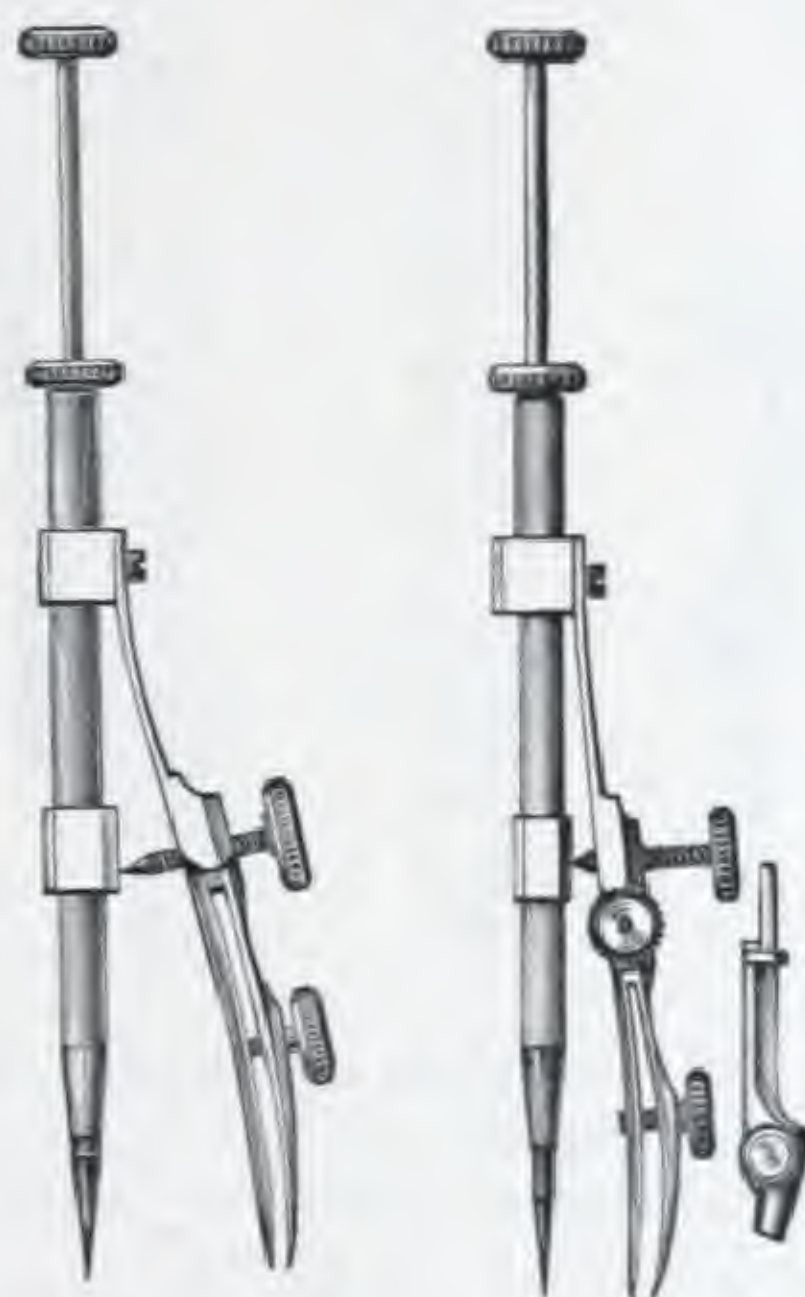
1585A

- 1580A  $3\frac{1}{4}$ -inch Bow Spacer, center adjustment, metal handle.....
- 1582A  $3\frac{1}{4}$ -inch Bow Pencil, center adjustment, adjustable needle point,  
metal handle.....
- 1585A  $3\frac{1}{4}$ -inch Bow Pen, center adjustment, adjustable needle point,  
spring on upper blade of pen, metal handle.....
- 1587A Imitation morocco covered case for three bow instruments.....
- 1588A Real morocco covered case for three bow instruments.....

These Bows have a screw on a right and left thread.



## ALTENER DRAWING INSTRUMENTS—Continued.

Illustrations  $\frac{2}{3}$  Size

1575A

1576A

EACH

- 1575A 4-inch Self-adjusting Needle-point Bow Pen.....
- 1576A 4-inch Self-adjusting Needle-point Bow Pen and Pencil.....
- 1577A 4-inch Self-adjusting Needle-point Bow Pen and Pencil, patent  
Spring-hinge Pen.....
- 1578A Real morocco covered case for any one of above.....
- 1584A  $3\frac{1}{4}$ -inch Bow Pen, center adjustment, adjustable needle point,  
with patent Spring-hinge Pen, metal handle.....
- Needle points for Altener Instruments.....
- Tubular Metal Case for lead or needle points.....
- Tubular Metal Case, filled with 6-H leads.....



## ALTENEDER DRAWING INSTRUMENTS—Continued.

Illustrations  $\frac{2}{3}$  size.

1534A

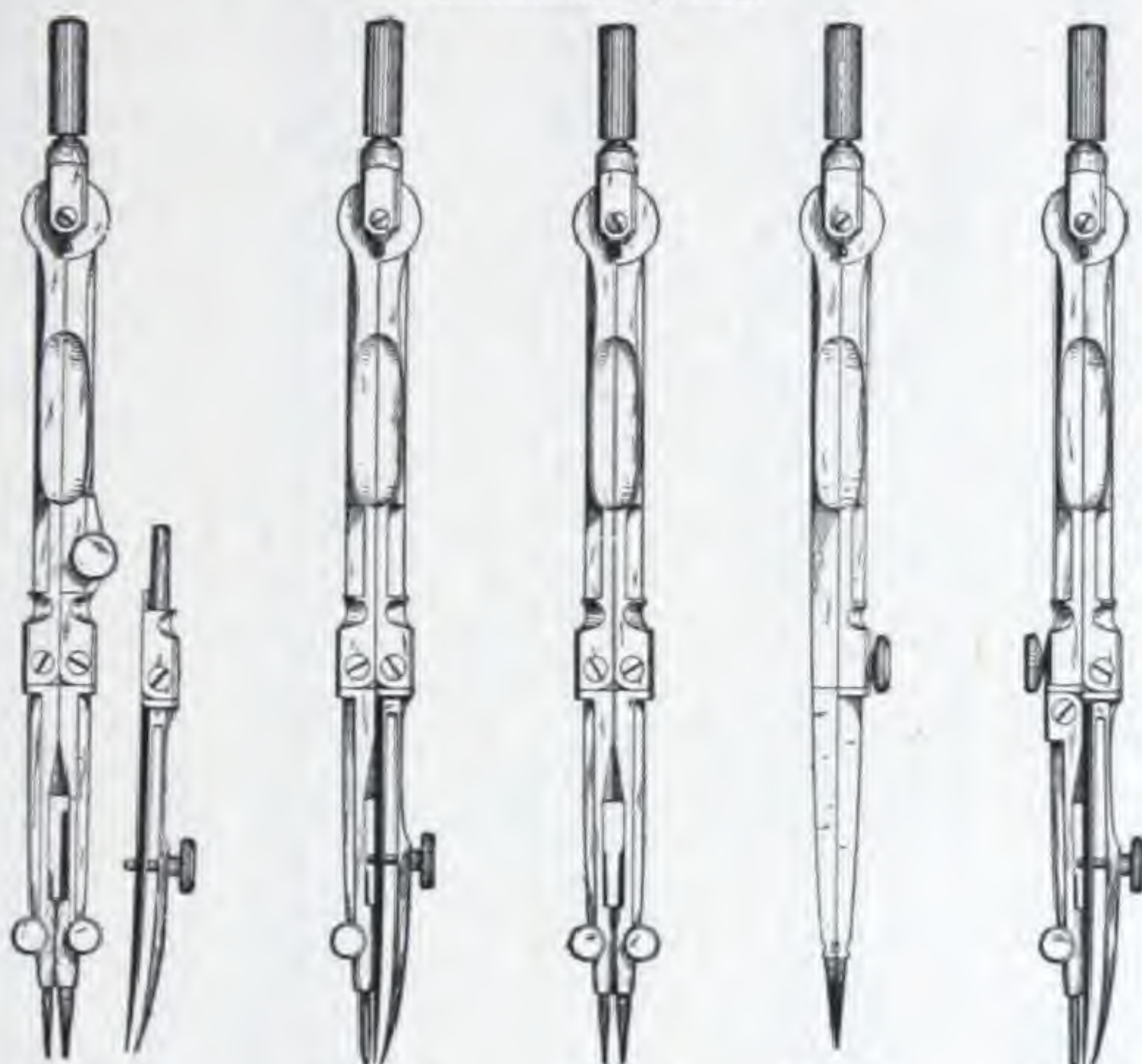


1584A

- 1534A 3 $\frac{1}{4}$ -inch Bow Pen, adjustable needle point, with patent Spring-hinge Pen, metal handle.....
- 1586A 3 $\frac{1}{4}$ -inch Bow Pen, center adjustment, adjustable needle point, with patent Lever Pen, metal handle.....
- 1540A 4 $\frac{1}{2}$ -inch Bow Spacer, metal handle.....
- 1541A 4 $\frac{1}{4}$ -inch Bow Spacer, with adjustable needle points, metal handle..
- 1542A 4 $\frac{1}{4}$ -inch Bow Pencil, adjustable needle point, metal handle.....
- 1543A 4 $\frac{1}{4}$ -inch Bow Pen, adjustable needle point, metal handle.....
- 1545A 4 $\frac{1}{4}$ -inch Bow Pen, adjustable needle point, spring on upper blade of pen, metal handle.....
- 1547A Imitation morocco covered case for three bow instruments.....
- 1548A Real morocco covered case for three bow instruments.....
- 1550A 5-inch Bow Spacer, metal handle.....
- 1551A 5-inch Bow Spacer, with adjustable needle points, metal handle...
- 1552A 5-inch Bow Pencil, adjustable needle point, metal handle.....
- 1555A 5-inch Bow Pen, adjustable needle point, spring on upper blade of pen, metal handle.....
- 1557A Imitation morocco covered case for three bow instruments.....
- 1558A Real morocco covered case for three bow instruments.....
- 1560A 6-inch Bow Spacer, metal handle.....
- 1561A 6-inch Bow Spacer, with adjustable needle points, metal handle..
- 1562A 6-inch Bow Pencil, adjustable needle point, metal handle.....
- 1565A 6-inch Bow Pen, adjustable needle point, spring on upper blade of pen, metal handle.....
- 1567A Imitation morocco covered case for three bow instruments.....
- 1568A Real morocco covered case for three bow instruments.....



## ALTENER DRAWING INSTRUMENTS—Continued.

Illustrations  $\frac{2}{3}$  size.

1470A

1477A

1479A

1483A

1497A

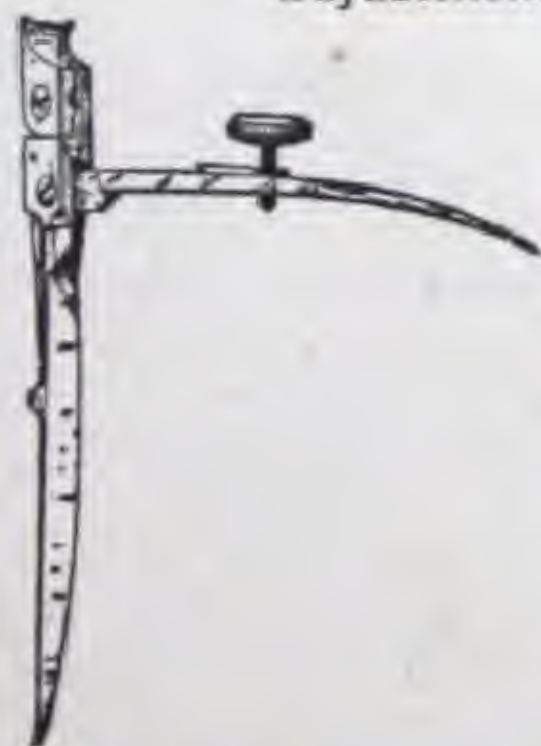
- 1470A 3½-inch Compass, pen and pencil, fixed needle-point leg.....  
 1474A 3½-inch Compass, pen, pencil and lengthening bar, fixed needle-point leg.....  
 1477A 3½-inch Compass, fixed pen and needle-point leg.....  
 1479A 3½-inch Compass, fixed pencil and needle-point leg.....  
 1480A 3½-inch Plain Divider.....  
 1481A 3½-inch Improved Plain Divider, with joints in legs.....  
 1483A 3½-inch Hairspring Divider.....  
 1484A 3½-inch Improved Hairspring Divider, with joints in legs.....

## COMPASSES WITH HAIRSPRING ADJUSTMENTS

- 1490A 3½-inch Compass, pen and pencil, fixed needle-point leg with hairspring adjustment.....  
 1494A 3½-inch Compass, pen, pencil and lengthening bar, fixed needle-point leg with hairspring adjustment.....  
 1497A 3½-inch Compass, fixed pen and needle-point leg with hairspring adjustment.....  
 1499A 3½-inch Compass, fixed pencil and needle-point leg with hairspring adjustment.....

## COMPASSES WITH PATENT PENS

Compasses Nos. 1470A, 1474A, 1477A, 1490A, 1494A and 1497A are furnished with Patent Spring-hinge Pen, in place of the regular type of pen, at an additional cost; and when desired should be specified thus: "1470A with Spring-hinge Pen."





## ALTENEDER DRAWING INSTRUMENTS—Continued.

Illustrations  $\frac{2}{3}$  size.

1447A



1449A



1453A



1467A



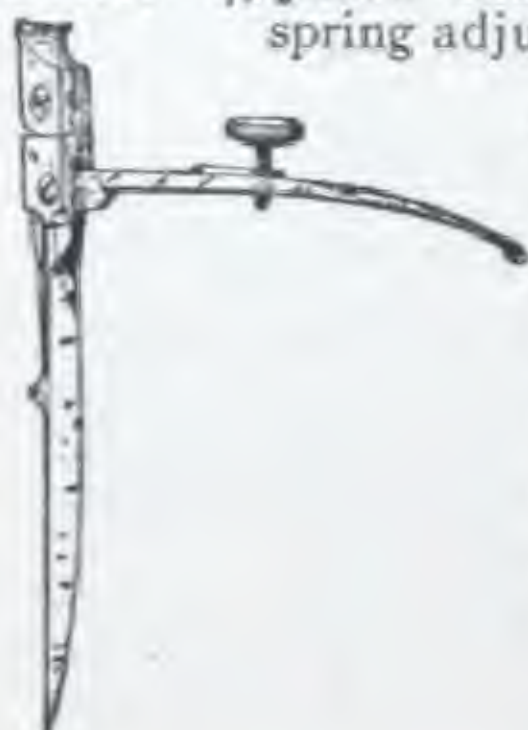
1469A

EACH

- 1447A 4 1/2-inch Compass, fixed pen and needle-point leg.....  
 1449A 4 1/2-inch Compass, fixed pencil and needle-point leg.....  
 1450A 4 1/2-inch Plain Divider.....  
 1451A 4 1/2-inch Improved Plain Divider, with joints in legs.....  
 1453A 4 1/2-inch Hairspring Divider.....  
 1454A 4 1/2-inch Improved Hairspring Divider, with joints in legs.....

**COMPASSES WITH HAIRSPRING ADJUSTMENT**

- 1464A 4 1/2-inch Compass, pen, pencil and lengthening bar, fixed needle-point leg, with hairspring adjustment.....  
 1467A 4 1/2-inch Compass, fixed pen and needle-point leg, with hairspring adjustment.....  
 1469A 4 1/2-inch Compass, fixed pencil and needle-point leg, with hairspring adjustment.....

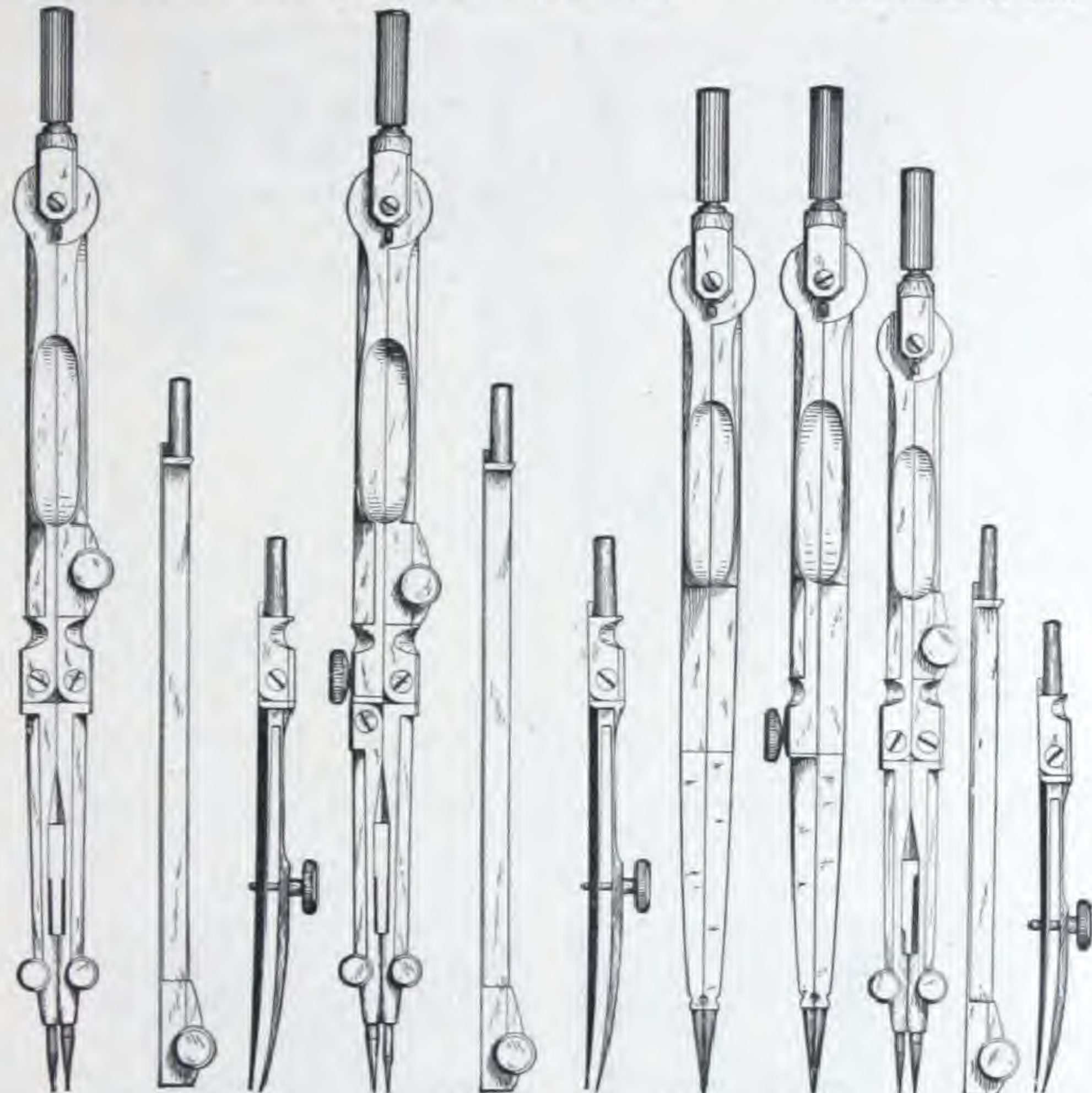
**COMPASSES WITH PATENT PENS**

Compasses Nos. 1444A, 1447A, 1464A and 1467A are furnished with Patent Spring-hinge Pen, in place of the regular type of pen, at an additional cost, and when desired should be specified thus: "1464A with Spring-hinge Pen."



ALTENEDER DRAWING INSTRUMENTS

Each Instrument is Stamped "T. Alteneder & Sons." Illustrations 3/4 Size.



1404A 1407A 1409A 1420A 1421A 1423A 1424A 1434A 1437A 1439A 1444A

- 1404A 5 1/2-inch Compass, pen, pencil and lengthening bar, fixed needle point leg.
- 1407A 5 1/2-inch Compass, fixed pen and needle point leg.
- 1409A 5 1/2-inch Compass, fixed pencil and needle point leg.
- 1420A 5 -inch Plain Divider.
- 1421A 5 -inch Improved Plain Divider with joints in legs.
- 1423A 5 -inch Hairspring Divider.
- 1424A 5 -inch Improved Hairspring Divider, with joints in legs.

COMPASSES WITH HAIRSPRING ADJUSTMENT

- 1434A 5 1/2-inch Compass, pen, pencil and lengthening bar, fixed needle point leg, with hairspring adjustment.
- 1437A 5 1/2-inch Compass, fixed pen and needle point leg, with hairspring adjustment.
- 1439A 5 1/2-inch Compass, fixed pencil and needle point leg with hairspring adjustment.
- 1444A 4 1/2-inch Compass, pen, pencil and lengthening bar, fixed needle point leg.

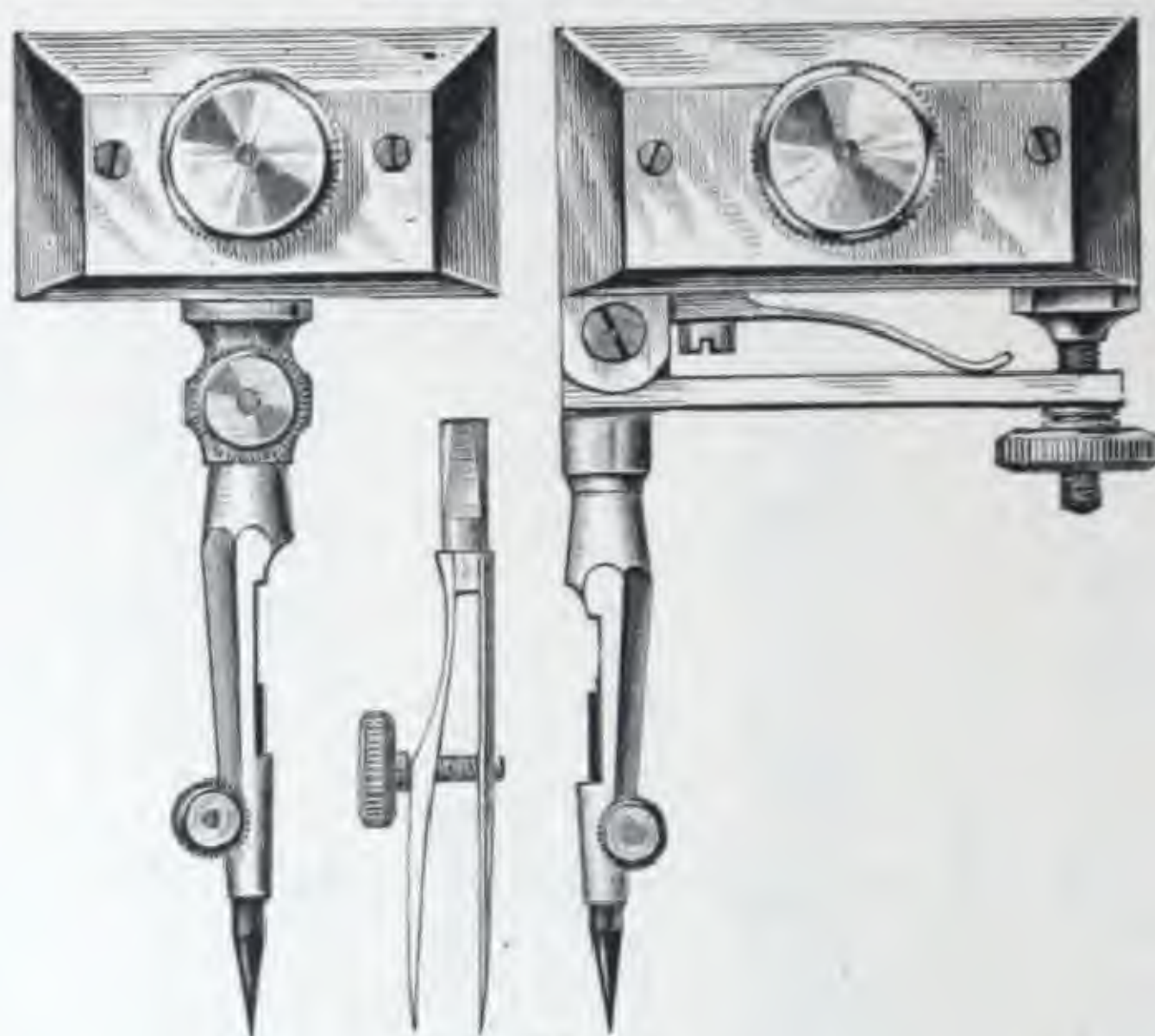


COMPASSES WITH PATENT PENS

Compasses Nos. 1404A, 1407A, 1434A and 1437A are furnished with Patent Spring-hinge Pen in place of the regular type of pen, at an additional cost, and when desired should be specified thus: "1404A with Spring-hinge Pen."



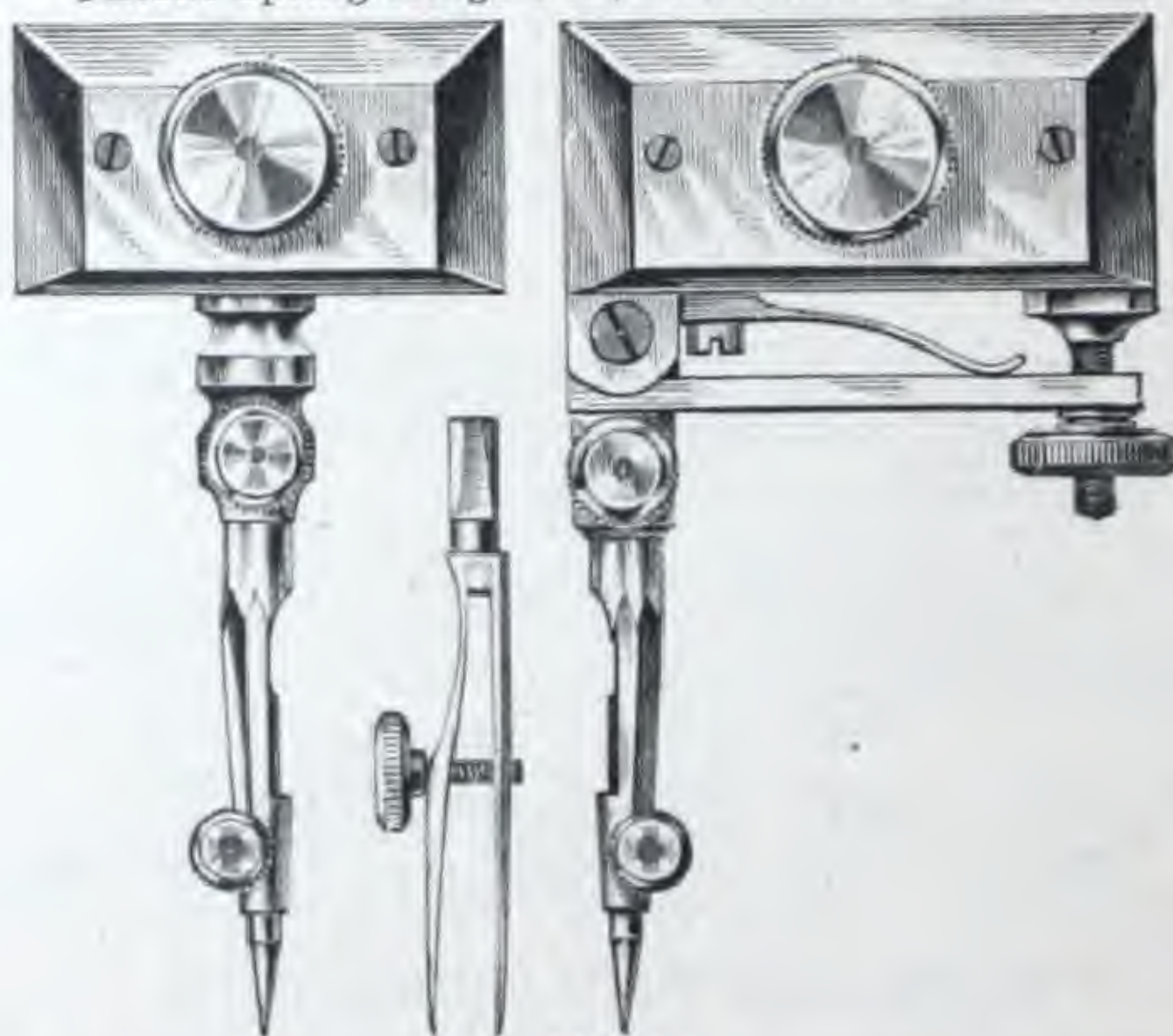
ALTENEDER DRAWING INSTRUMENTS—Continued.  
Illustrations  $\frac{2}{3}$  Size.



1671A

- 1670A Small size Beam Compass, fixed needle point leg, with pen and pencil, micrometer adjustment.....  
1671A Large size Beam Compass, fixed needle point leg, with pen and pencil, micrometer adjustment.....

Patent Spring Hinge Pen, at an additional cost.



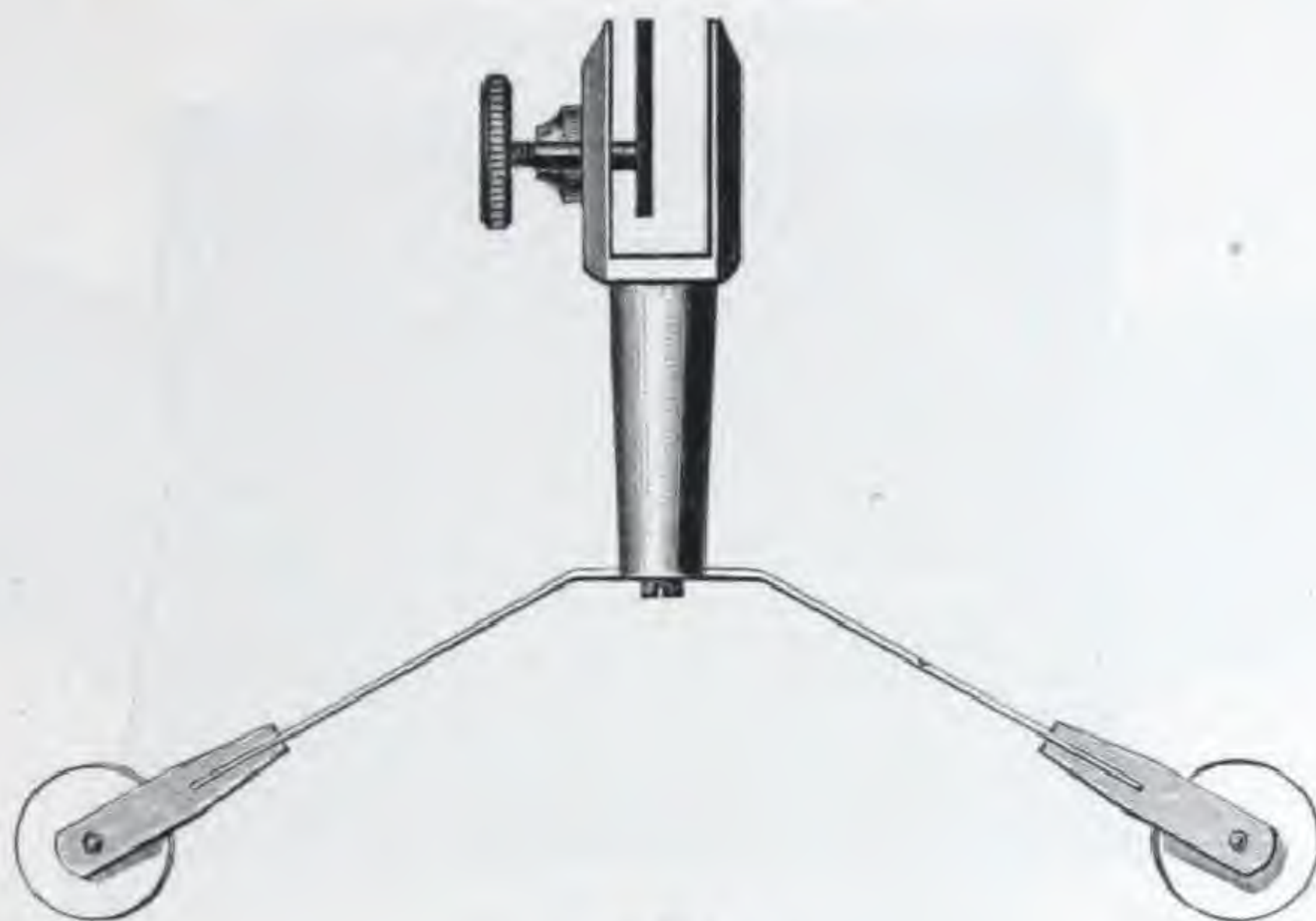
1673A

- 1672A Small size Beam Compass, interchangeable needle point, pen and pencil legs, micrometer adjustment.....  
1673A Large size Beam Compass, interchangeable needle point, pen and pencil legs, micrometer adjustment.....

Patent Spring Hinge Pen, at an additional cost.  
For Beam Compass Bars, see page 158

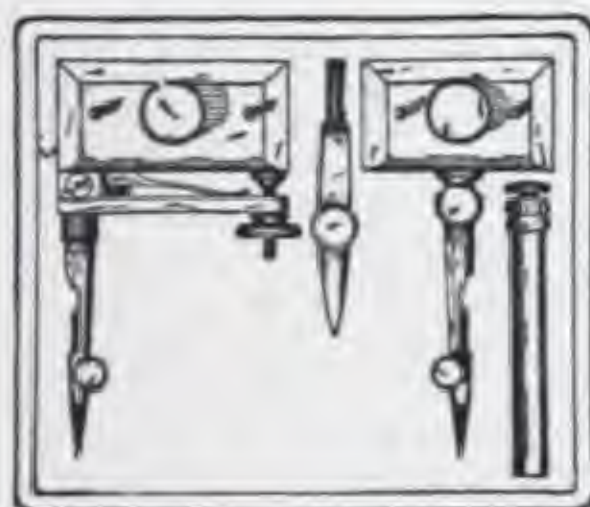


## ALTENEDER DRAWING INSTRUMENTS—Continued.

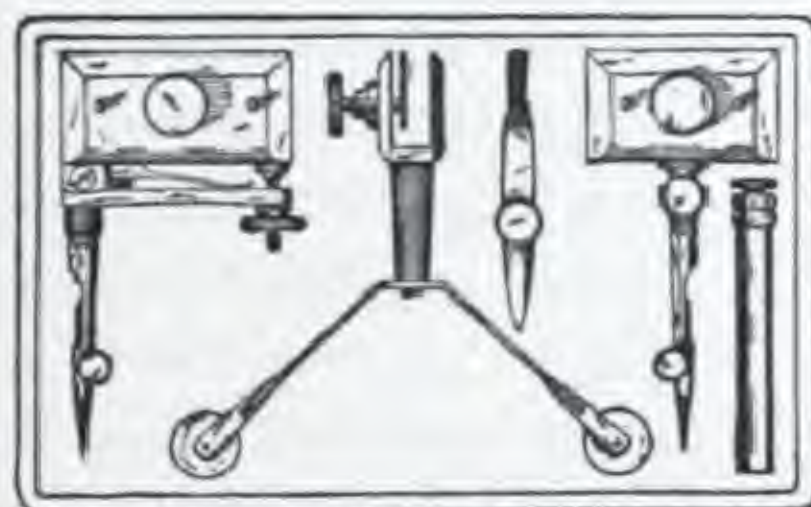
Illustrations  $\frac{2}{3}$  Size.

1676A

- 1675A Small size Beam Compass Wheel Attachment.....  
 1676A Large size Beam Compass Wheel Attachment.....



1678A



1682A

- 1678A Beam Compass No. 1670A in morocco covered case.....  
 1679A Beam Compass No. 1671A in morocco covered case.....  
 1680A Beam Compass No. 1672A in morocco covered case.....  
 1681A Beam Compass No. 1673A in morocco covered case.....  
 1682A Beam Compass No. 1670A and Wheel Attachment No. 1675A  
     in morocco covered case.....  
 1683A Beam Compass No. 1671A and Wheel Attachment No. 1676A  
     in morocco covered case.....  
 1684A Beam Compass No. 1672A and Wheel Attachment No. 1675A  
     in morocco covered case.....  
 1685A Beam Compass No. 1673A and Wheel Attachment No. 1676A  
     in morocco covered case.....

For Beam Compass Bars, see page 158



## ALTENEDER DRAWING INSTRUMENTS—Continued.

Illustration  $\frac{2}{3}$  Size.

2066A

**2066A** Morocco Covered Case containing:

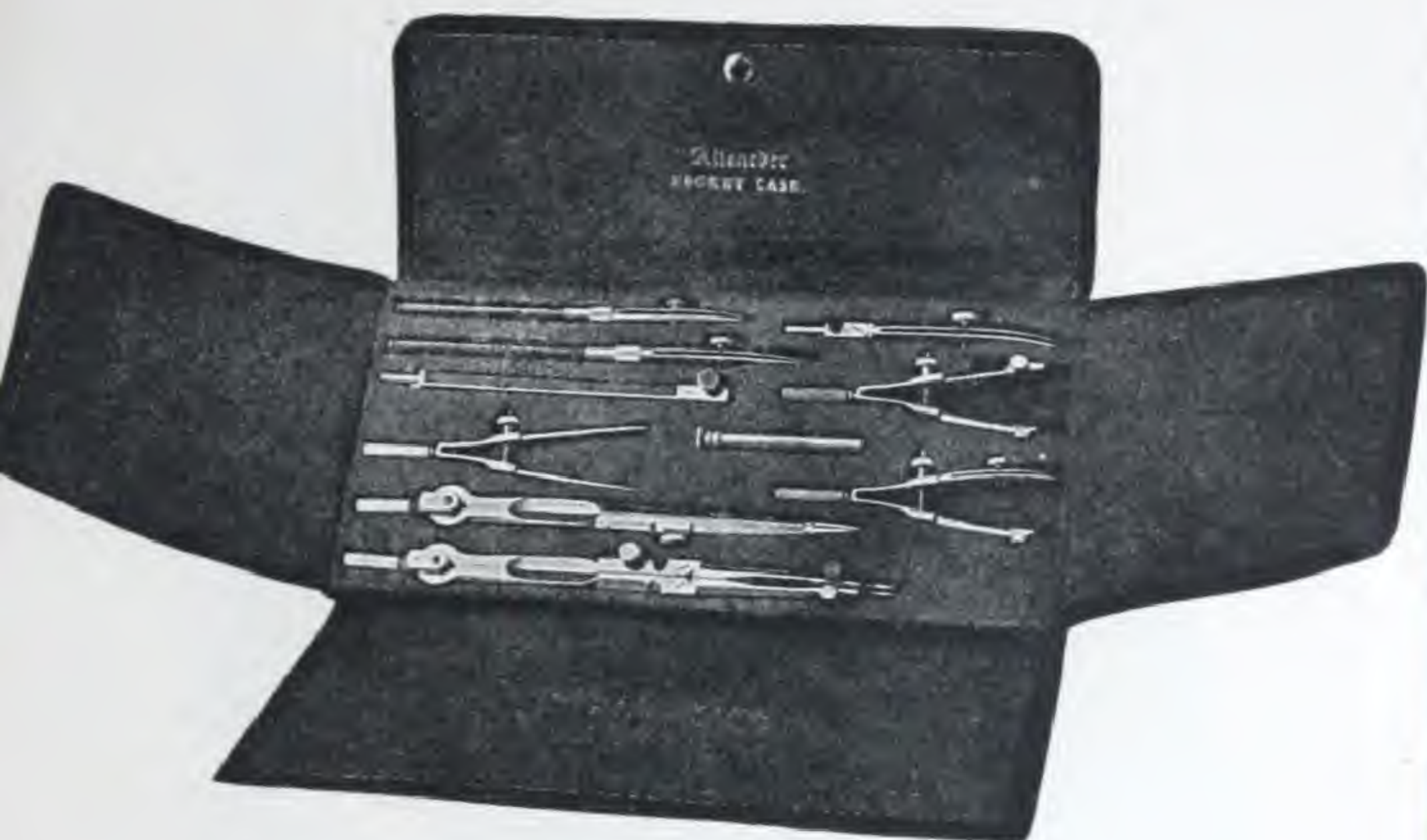
- 1404A 5½-inch Compass, pen, pencil and lengthening bar, fixed needle point leg.
- 1423A 5-inch Hairspring Divider.
- 1530A 3¼-inch Bow Spacer.
- 1532A 3¼-inch Bow Pencil.
- 1533A 3¼-inch Bow Pen.
- 1613A 4¼-inch Ruling Pen.
- 1614A 5 -inch Ruling Pen.
- Nickel-plated Lead Case.....

**2067A** Morocco Covered Case containing:

- 1434A 5½-inch Compass, pen, pencil and lengthening bar, fixed needle point leg, with hairspring adjustment.
- 1423A 5-inch Hairspring Divider.
- 1530A 3¼-inch Bow Spacer.
- 1532A 3¼-inch Bow Pencil.
- 1533A 3¼-inch Bow Pen.
- 1613A 4¼-inch Ruling Pen.
- 1614A 5 -inch Ruling Pen.
- Nickel-plated Lead Case.....



## ALTENER DRAWING INSTRUMENTS—Continued.

Illustration  $\frac{2}{3}$  Size.

2068A

## 2068A Altener Folding Pocket Case containing:

- 1404A 5½-inch Compass, pen, pencil and lengthening bar, fixed needle-point leg.
- 1423A 5-inch Hairspring Divider.
- 1530A 3¼-inch Bow Spacer.
- 1532A 3¼-inch Bow Pencil.
- 1533A 3¼-inch Bow Pen.
- 1613A 4¼-inch Ruling Pen.
- 1614A 5 -inch Ruling Pen.
- Nickel-plated Lead Case.....

## 2070A Altener Folding Pocket Case containing:

- 1434A 5½-inch Compass, pen, pencil and lengthening bar, fixed needle-point leg, with hairspring adjustment.
- 1423A 5-inch Hairspring Divider.
- 1530A 3¼-inch Bow Spacer.
- 1532A 3¼-inch Bow Pencil.
- 1533A 3¼-inch Bow Pen.
- 1613A 4¼-inch Ruling Pen.
- 1614A 5 -inch Ruling Pen.
- Nickel-plated Lead Case.....



## ALTENEDER DRAWING INSTRUMENTS—Continued.

Illustration  $\frac{2}{3}$  Size.

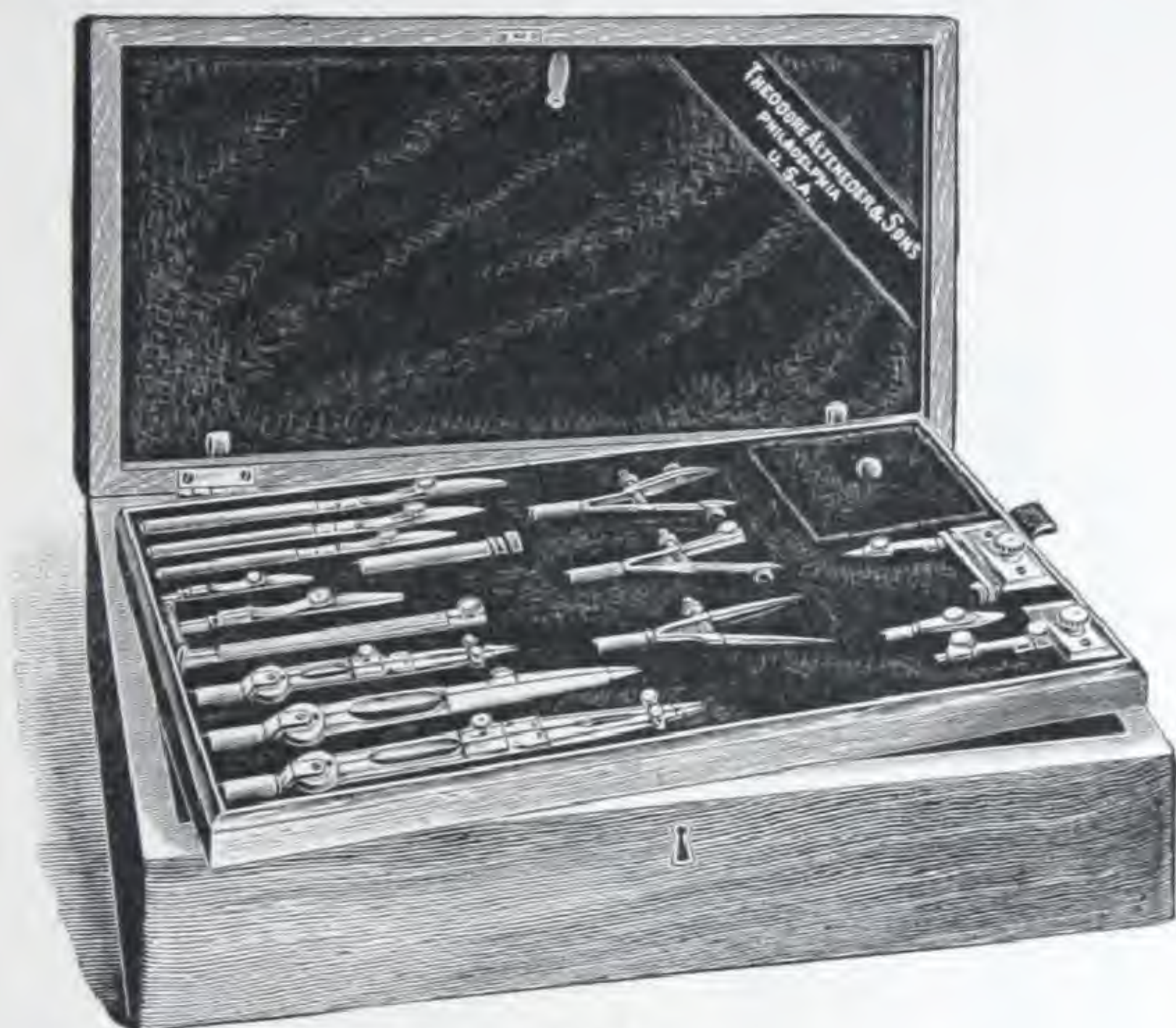
2071A

2071A Alteneder Folding Pocket Case containing:

- 1434A 5½-inch Compass, spring hinge pen, pencil and lengthening bar, fixed needle-point leg, with hairspring adjustment.
- 1423A 5-inch Hairspring Divider.
- 1530A 3¼-inch Bow Spacer.
- 1532A 3¼-inch Bow Pencil.
- 1534A 3¼-inch Bow Pen, with spring hinge pen.
- 1600A 4¼-inch Spring Hinge Ruling Pen.
- 1602A 5 -inch Spring Hinge Ruling Pen.
- Nickel-plated Lead Case.....



## ALTENEDER DRAWING INSTRUMENTS—Continued.

Illustration  $\frac{2}{3}$  size.

2124A

- 2124A** Mahogany Case with lock, loose cushion and tray. Size of tray,  $6\frac{1}{4}$  x  $13\frac{1}{4}$  inches, containing:
- 1404A  $5\frac{1}{2}$ -inch Compass, pen, pencil and lengthening bar, fixed needle-point leg.
  - 1423A 5-inch Hairspring Divider.
  - 1470A  $3\frac{1}{2}$ -inch Compass, pen and pencil, fixed needle-point leg.
  - 1530A, 1532A and 1533A,  $3\frac{1}{4}$ -inch Spring Bow Instruments.
  - 1613A  $4\frac{1}{4}$ -inch Ruling Pen.
  - 1614A 5-inch Ruling Pen.
  - 1615A  $5\frac{1}{2}$ -inch Ruling Pen.
  - 1671A Large size Beam Compass.
  - Nickel-plated Lead Case.....
- 2125A** Mahogany Case, with lock, loose cushion and tray. Size of tray,  $6\frac{1}{4}$  x  $13\frac{1}{4}$  inches, containing:
- 1434A  $5\frac{1}{2}$ -inch Compass, pen, pencil and lengthening bar, fixed needle-point leg with hairspring adjustment.
  - 1424A 5-inch Hairspring Divider.
  - 1490A  $3\frac{1}{2}$ -inch Compass, pen and pencil, fixed needle-point leg, with hairspring adjustment.
  - 1530A, 1532A and 1533A,  $3\frac{1}{4}$ -inch Spring Bow Instruments.
  - 1613A  $4\frac{1}{4}$ -inch Ruling Pen.
  - 1614A 5-inch Ruling Pen.
  - 1615A  $5\frac{1}{2}$ -inch Ruling Pen.
  - 1671A Large size Beam Compass.
  - Nickel-plated Lead Case.....



EXTRA FINE GERMAN DRAWING INSTRUMENTS  
OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH STEEL

Illustrations  $\frac{2}{3}$  Size



1100

1101

1102

1100R

1101R

1102R

EACH

**1100** Ruling Pen,  $4\frac{1}{2}$  inches, upper blade with spring, ebony handle. . .

**1101** Ruling Pen, 5 inches, upper blade with spring, ebony handle. . .

**1102** Ruling Pen,  $5\frac{1}{2}$  inches, upper blade with spring, ebony handle. . .

**1100R** Release Ruling Pen,  $4\frac{1}{2}$  inches, spring blade, ebony handle. . . . .

**1101R** Release Ruling Pen, 5 inches, spring blade, ebony handle. . . . .

**1102R** Release Ruling Pen,  $5\frac{1}{2}$  inches, spring blade, ebony handle. . . . .

The "Release" Pens have the advantage over others in that they can be opened (for cleaning) and closed in much less time; that the adjustment for width of line is not disturbed by opening and closing the pen, and that the thread of the screw is not so easily worn off.



## EXTRA FINE GERMAN DRAWING INSTRUMENTS

Illustration  $\frac{2}{3}$  Size

1103



1104



1105



1106

EACH

- 1103** 5½ inch Spring-hinge Ruling Pen.....  
**1106** 4¼ inch Sliding Catch Device Ruling Pen.....  
**1105** 5 inch Sliding Catch Device Ruling Pen.....  
**1104** 5½ inch Sliding Catch Device Ruling Pen.....



EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued.  
OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH STEEL

Illustrations  $\frac{2}{3}$  Size.



1113



1114



1115



1116

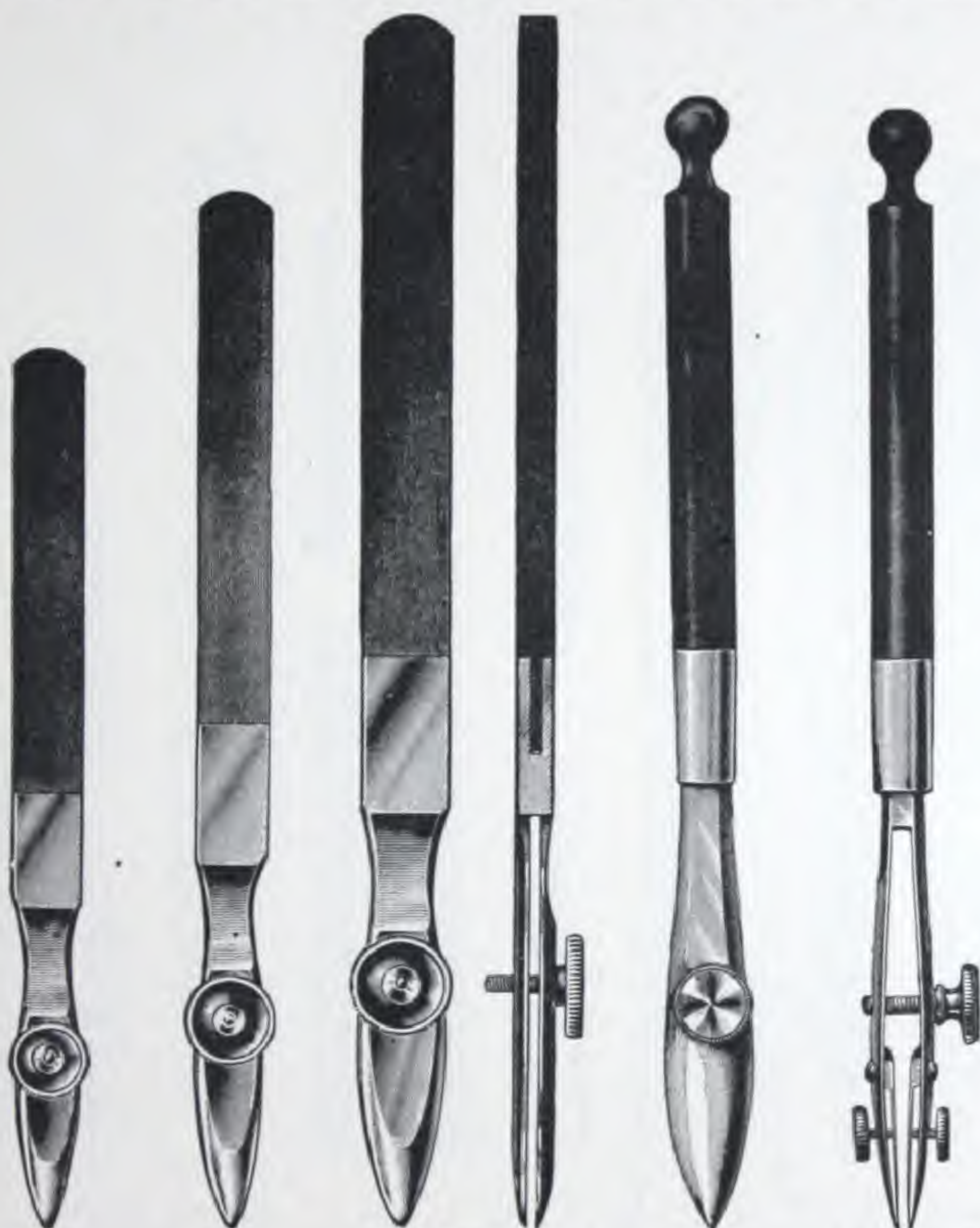


1118

- 1113 Border Pen,  $6\frac{1}{4}$  inches, Improved, ivory handle.....  
1114 Railroad Pen,  $5\frac{1}{4}$  inches, ebony handle. The pens are fastened  
to a rod in a hollow handle, with screw at upper end to set pens  
firm for straight lines, or loose to follow curved lines.....  
1115 Railroad Pen, German silver, with joints, ivory handle.....  
1116 Curve Pen,  $4\frac{3}{4}$  inches, ebony handle. Blades fastened to a rod  
in a hollow handle, with screw at upper end to set pen firm, or  
loose to follow smallest curve with precision.....  
1117 Wedge Pen,  $5\frac{1}{2}$  inches, metal handle, which opens and closes by  
turning thumbscrew at upper end of handle.....  
1118 Pricker Point, ebony handle.....



EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued.  
OF COLD ROLLED GERMAN SILVER AND BEST ENGLISH STEEL



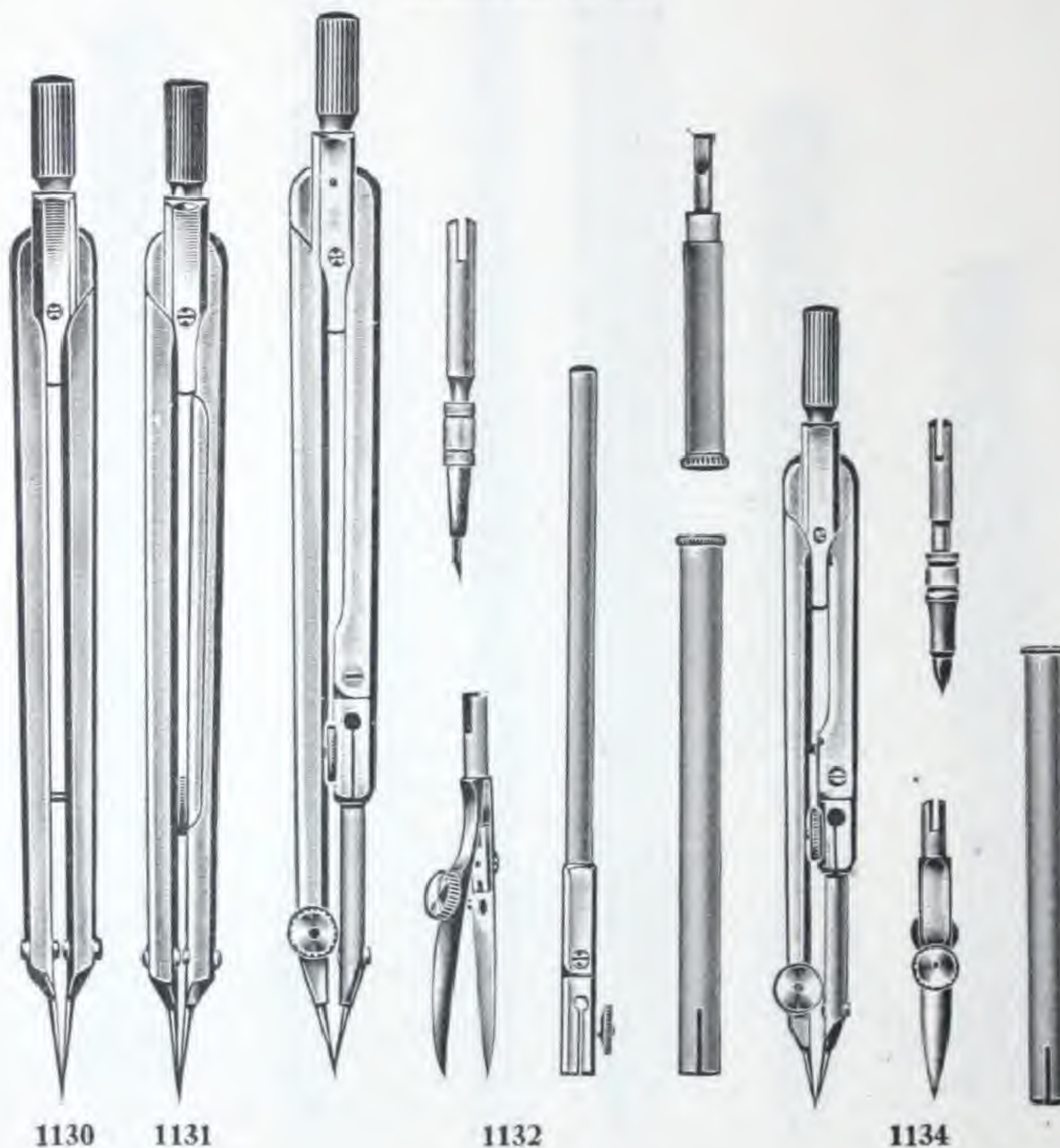
1119 1120 1121 1122 1123 EACH

- 1119 Swedish Detail Ruling Pen, 5 inches, ebony handle, upper blade with spring, for long lines.....
- 1120 Swedish Detail Ruling Pen, 6 inches, ebony handle, upper blade with spring, for long lines.....
- 1121 Swedish Detail Ruling Pen, 7 inches, ebony handle, upper blade with spring, for long lines.....
- 1122 Detail Pen, 6 1/4 inches, round ebony handle.....
- 1123 Detail Pen, 6 1/2 inches, round ebony handle, for double lines.....

These Pens are adapted for drawing long and heavy lines, and, being made to hold much ink, do not require frequent filling.



## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued

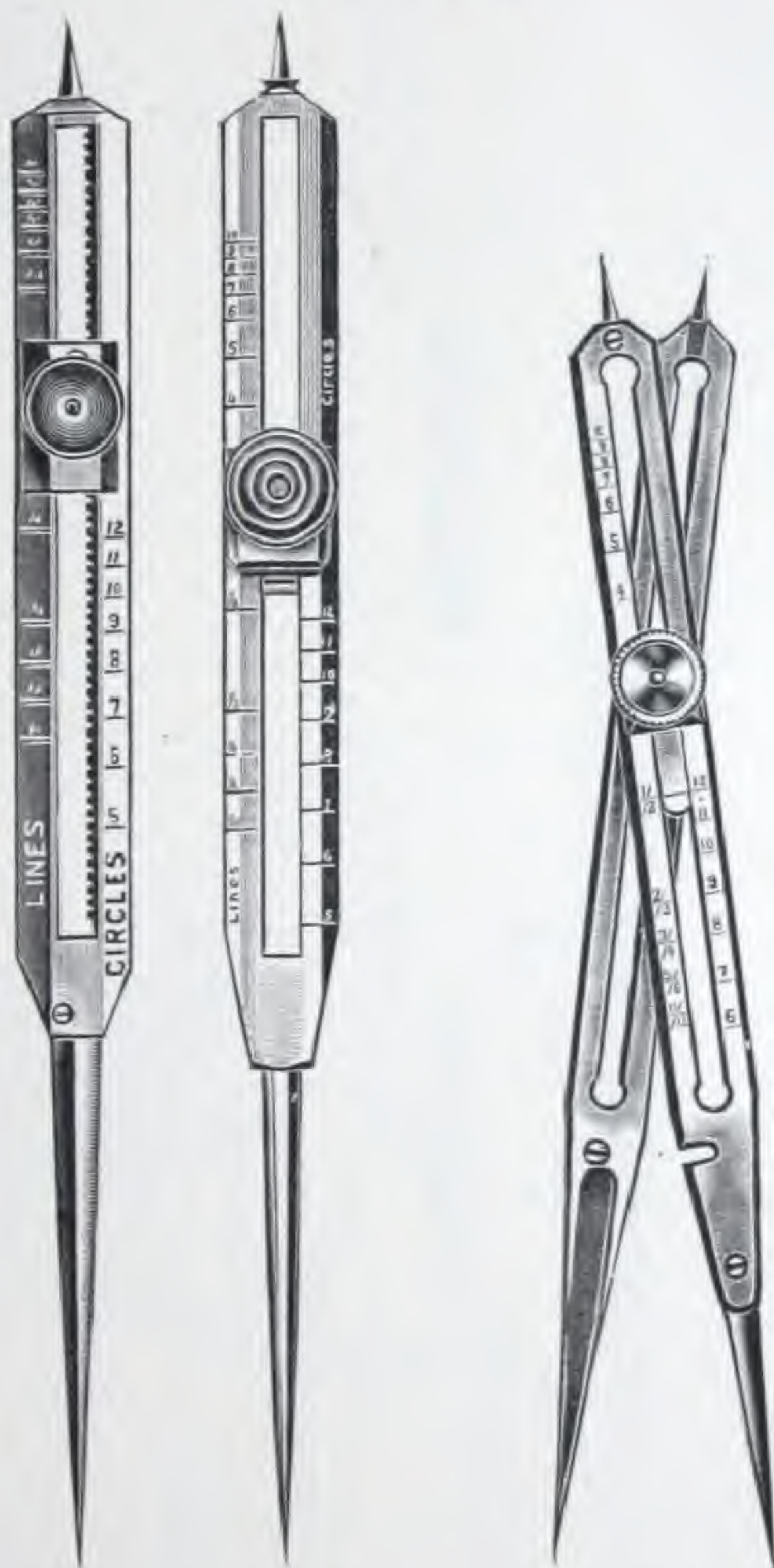
Illustration  $\frac{2}{3}$  Size

- 1130 Plain Divider, 6 inches, replaceable steel points.....
- 1131 Hairspring Divider, 6 inches, replaceable steel points.....
- 1132 Compass, 6 inches, replaceable needle point, pen, pencil, lengthening bar, combination key and lead box, metal handle with reserve needle points.....
- 1133 Compass. Same as No. 1132, with hairspring attachment.....
- 1134 Compass. Same as No. 1132, but 4 inches long.....

EACH



## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued

Illustration  $\frac{2}{3}$  Size

1140

1141

1142

EACH

1140 Proportional Divider, 7 inches, divided for lines and circles.....

1141 Proportional Divider, 7 inches, divided for lines and circles, rack and pinion movement.....

1142 Proportional Divider, 6 inches, divided for lines and circles, with movable steel points.....



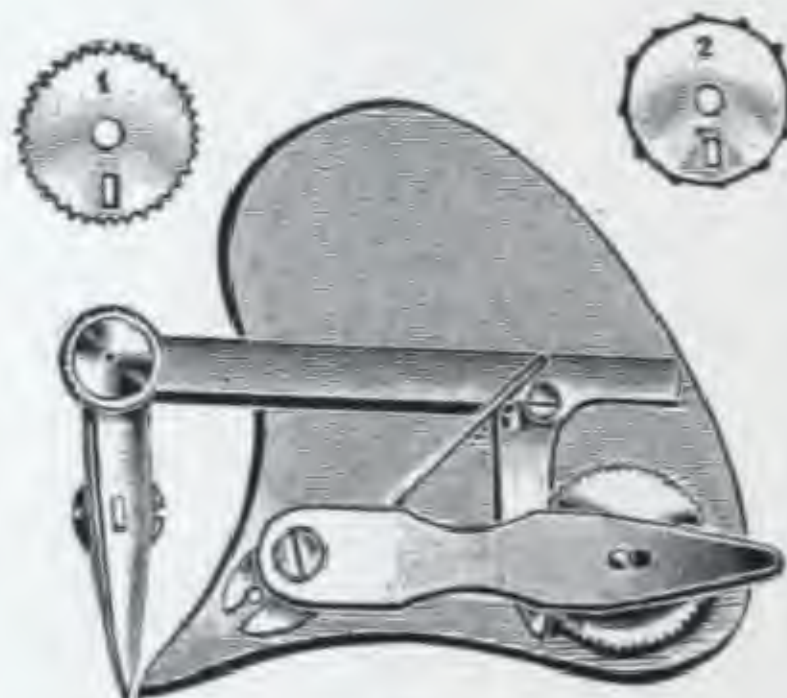
## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued

Illustration  $\frac{2}{3}$  Size

1145



1146



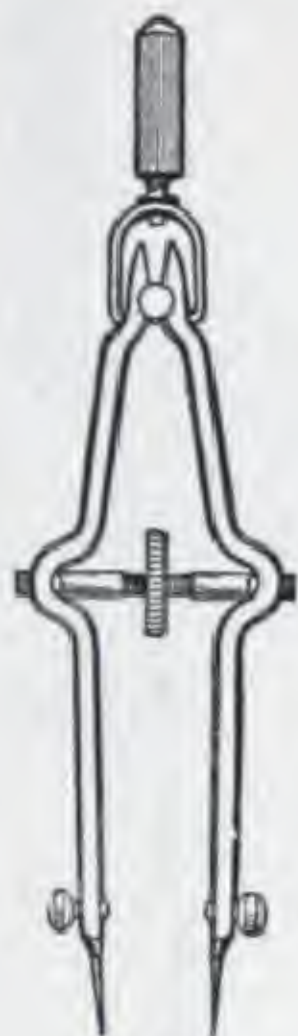
1147

EACH

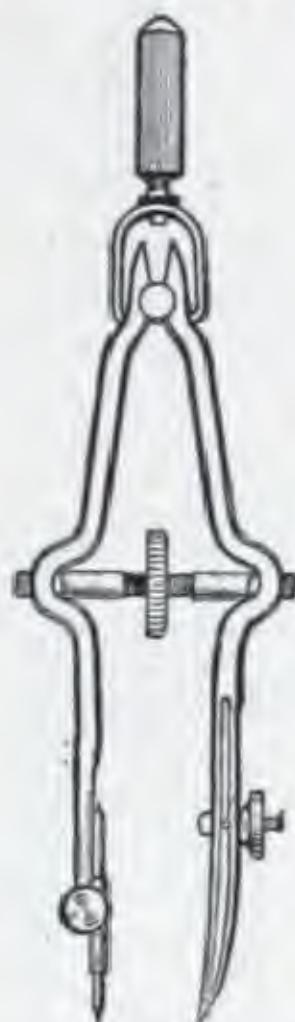
- 1145 Drop Spring Bow Pen,  $4\frac{1}{2}$  inches, self-adjusting.....
- 1146 Drop Spring Bow Pen and Pencil,  $4\frac{1}{2}$  inches, self adjusting.....
- 1147 Dotting Instrument for straight lines, with three wheels, in case..



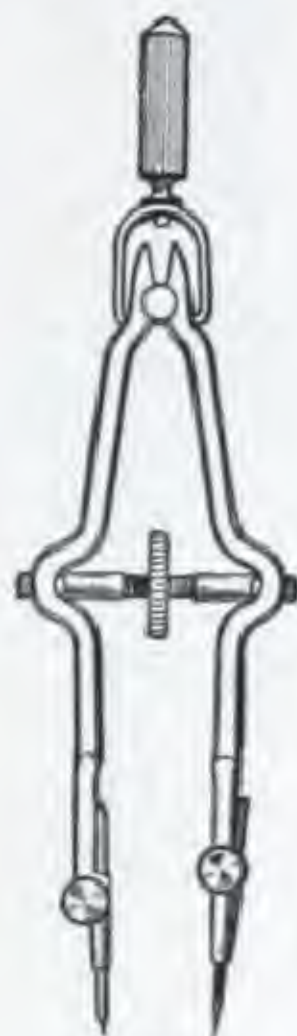
## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued

Illustration  $\frac{1}{2}$  Size

1150



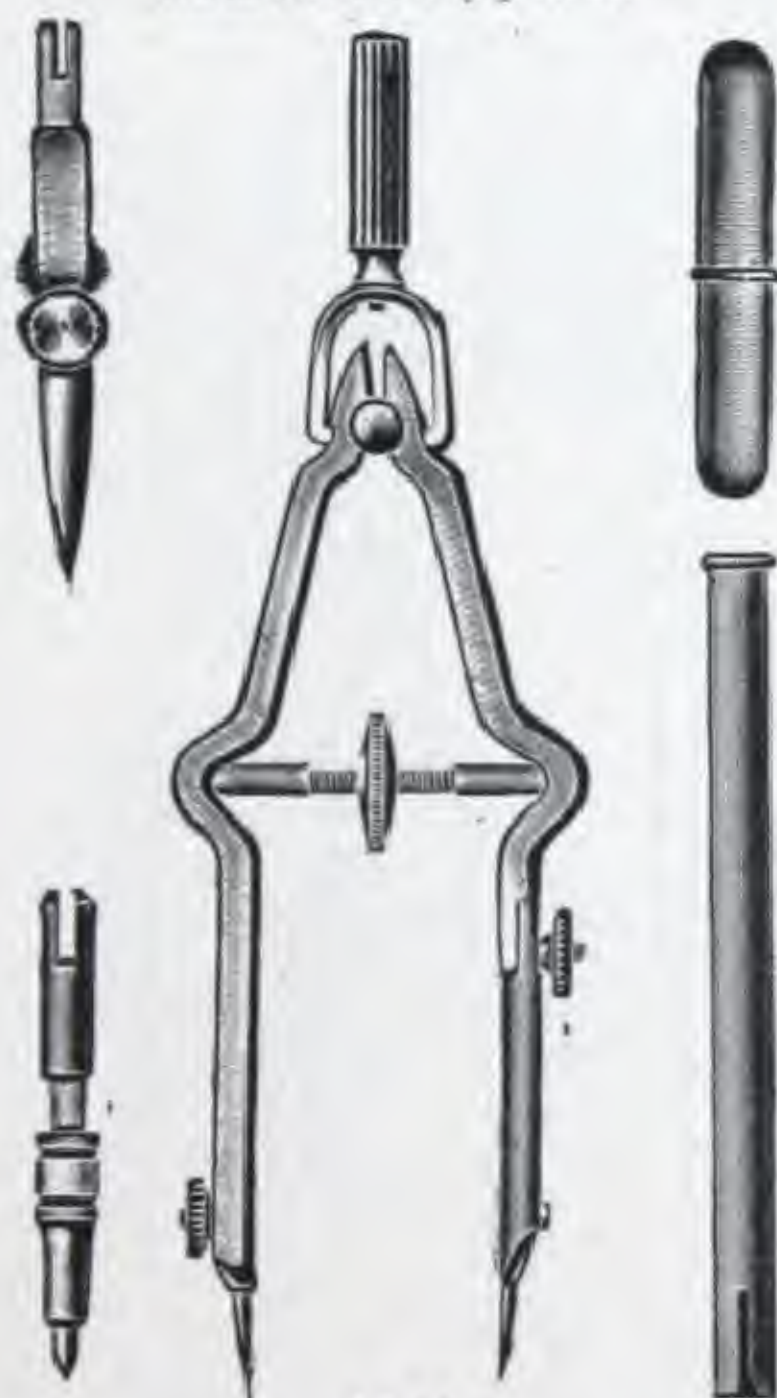
1151



1152

EACH

- 1150 New Style Bow Divider,  $4\frac{1}{2}$  inches, center wheel, replaceable steel points.....  
 1151 New Style Bow Pen,  $4\frac{1}{2}$  inches, center wheel.....  
 1152 New Style Bow Pencil,  $4\frac{1}{2}$  inches, center wheel.....

Illustration  $\frac{2}{3}$  Size

1153

- 1153 New Style Spring Bow Instrument,  $4\frac{1}{4}$  inches, with needle point, center wheel adjustment, one changeable steel point, pen part with sliding catch device, pencil part, metal handle with reserve needle points, lead box, in case.....each



## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued



1154



1154A



1154B

EACH

- 1154 Bow Divider,  $4\frac{1}{4}$  inches, center wheel, replaceable needle points..  
 1154A Bow Pen,  $4\frac{1}{4}$  inches, center wheel,.....  
 1154B Bow Pencil,  $4\frac{1}{4}$  inches, center wheel.....



1155



1156



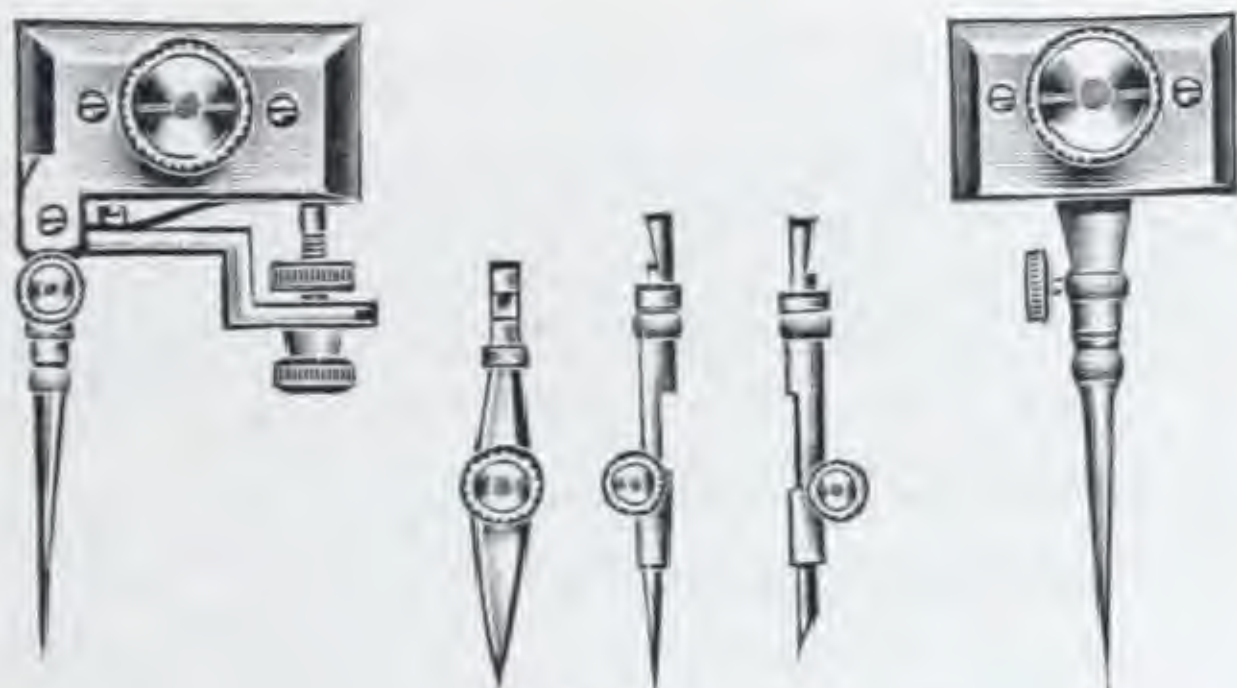
1157

EACH

- 1155 Bow Divider,  $3\frac{3}{4}$  inches, replaceable needle points..  
 1156 Bow Pen,  $3\frac{3}{4}$  inches.....  
 1157 Bow Pencil,  $3\frac{3}{4}$  inches.....



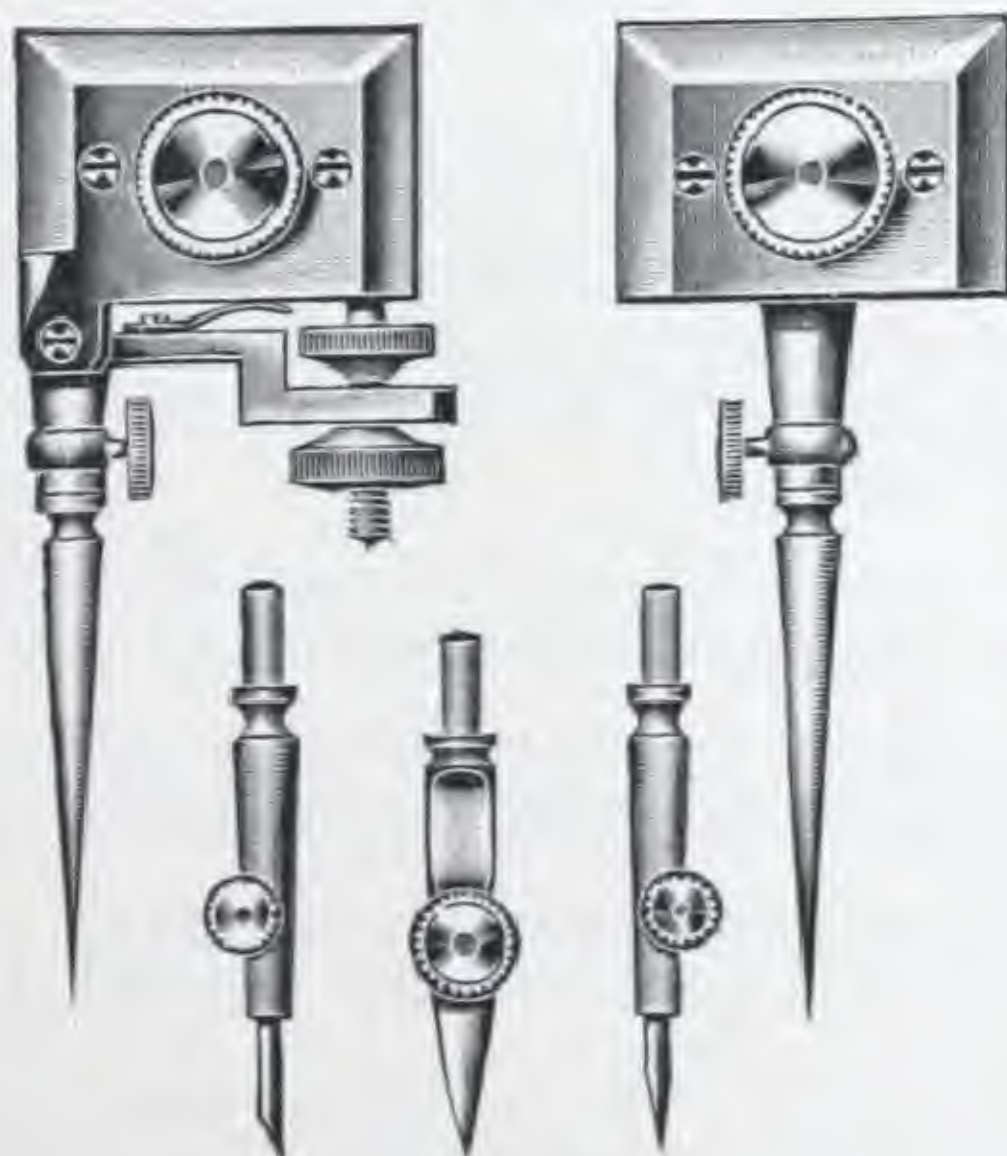
## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued

Illustration  $\frac{2}{3}$  Size

1158

1158 Beam Compass, small size, with two steel points, pen, pencil, needle point, with micrometer adjustment, in case.....

EACH



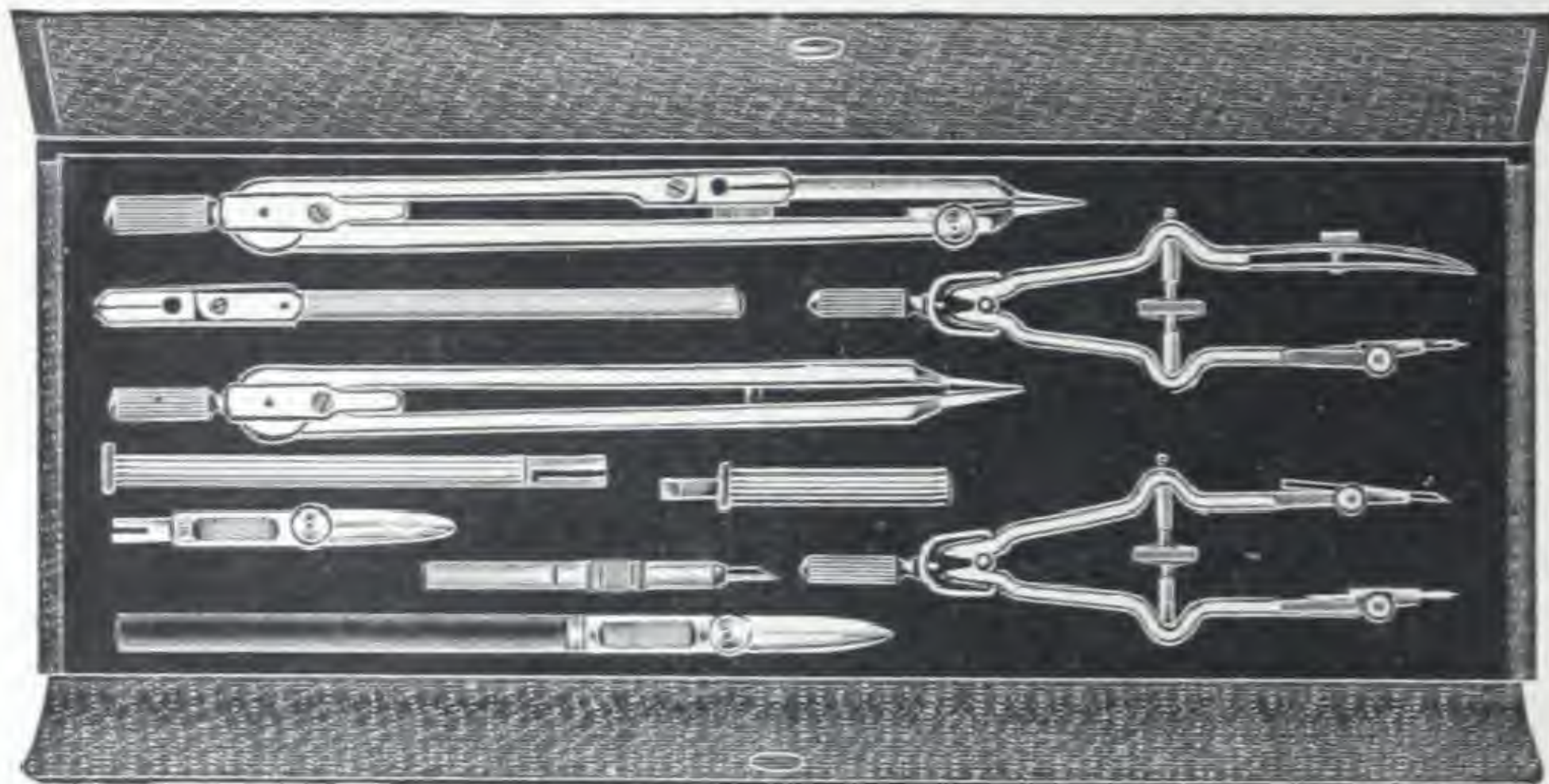
1159

1159 Beam Compass, large size, with two steel points, pen, pencil, needle point, with micrometer adjustment, in case.....

EACH



## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued



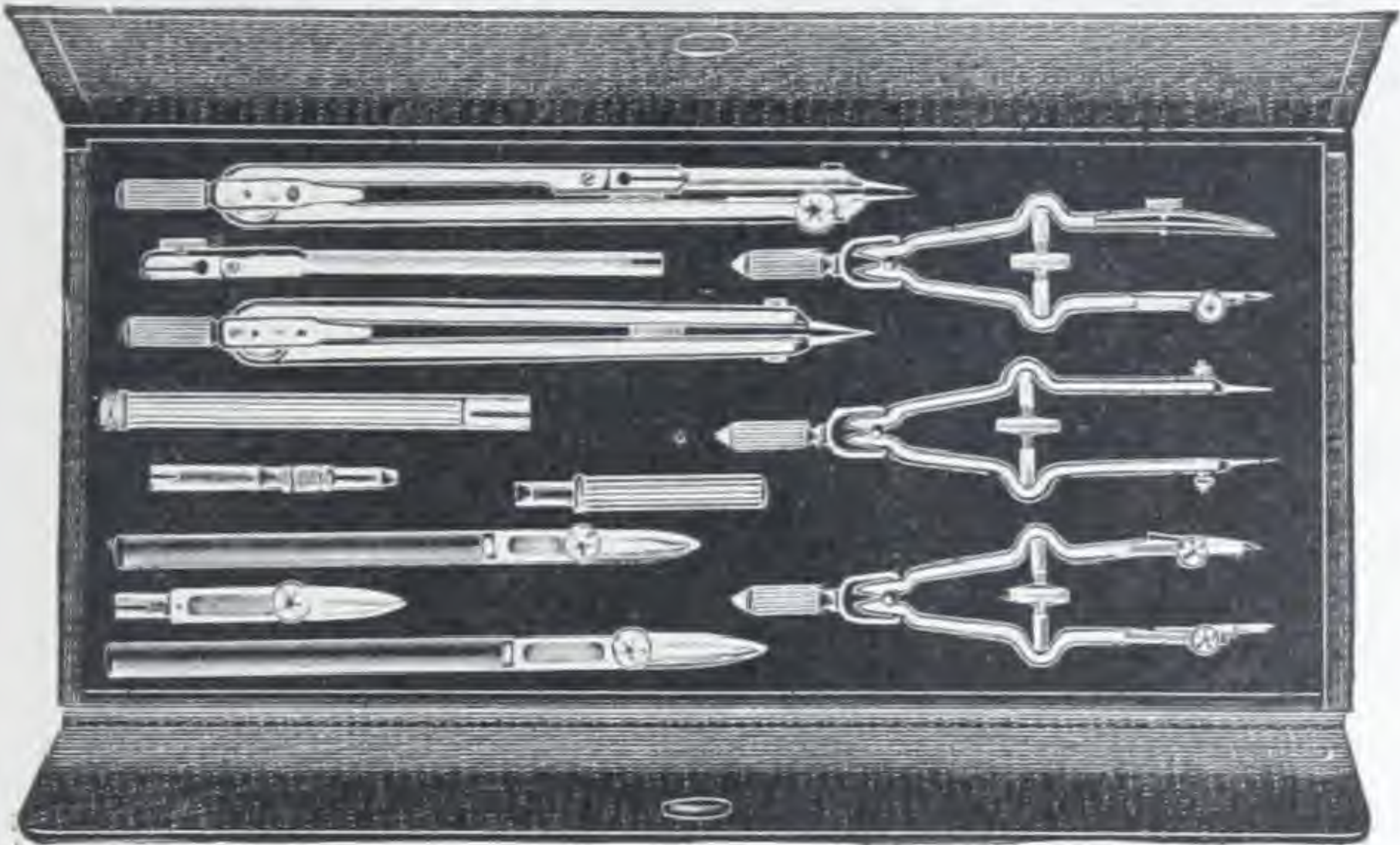
## 1160

## 1160 Containing:

- No. 1102 Ruling Pen,  $5\frac{1}{2}$  inches, metal handle.
- No. 1132 Compass, 6 inches, replaceable needle point, one changeable steel point, pen, pencil parts and lengthening bar, improved pivot joint, straightening device, metal handle with reserve needle points.
- No. 1130 Plain Divider,  $5\frac{3}{4}$  inches, replaceable steel points, improved pivot joint, straightening device.
- No. 1151 New Style Circular Spring Bow Pen,  $4\frac{1}{4}$  inches, center wheel adjustment, replaceable steel points.
- No. 1152 New Style Circular, Spring Bow Pencil,  $4\frac{1}{4}$  inches, center wheel adjustment, combination key and lead box, center tack.
- Improved silk velvet pocket book case.....PER SET



EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued



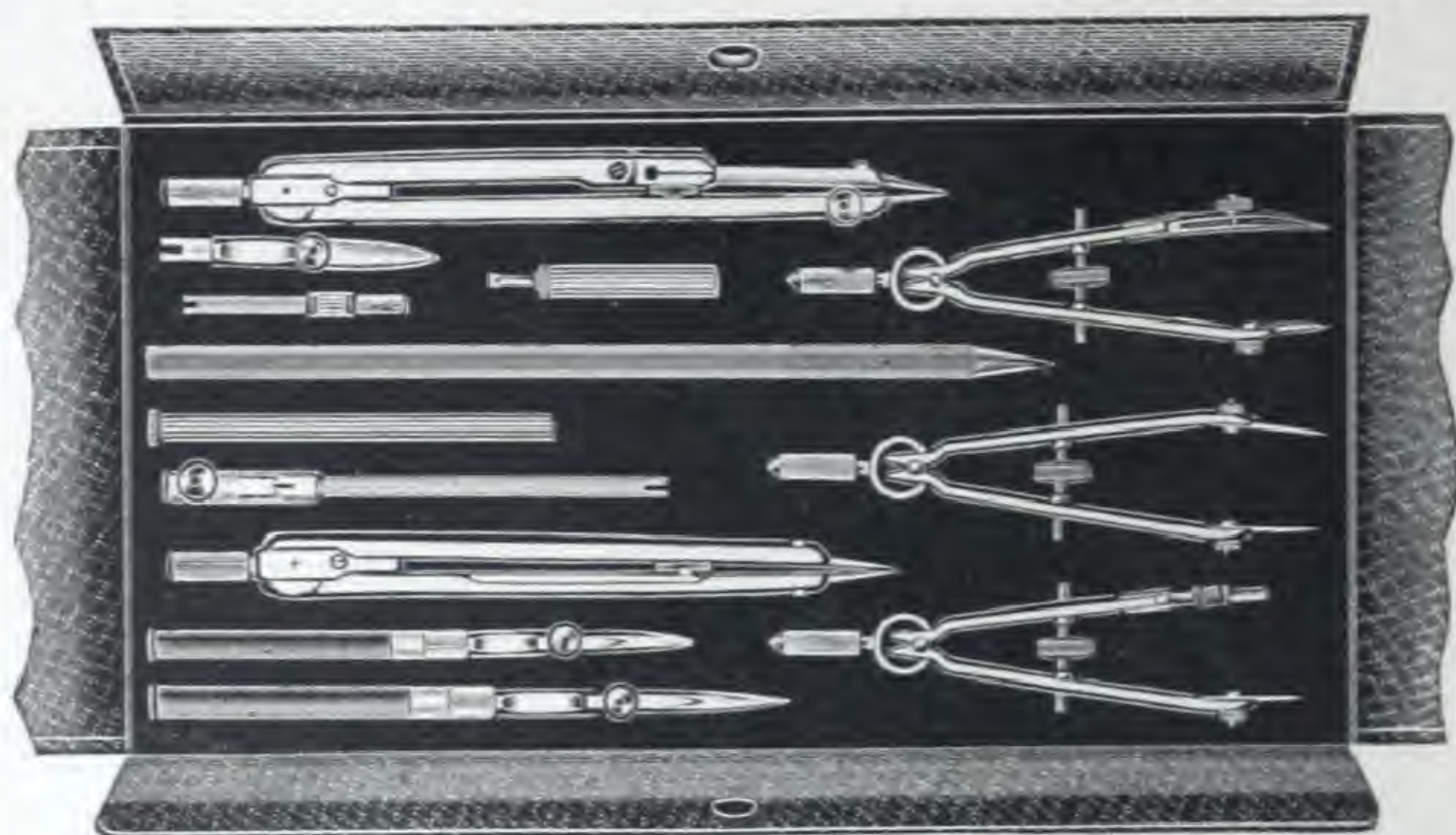
1161

1161 Containing:

- No. 1100 Ruling Pen, 4½ inches, metal handle.
  - No. 1102 Ruling Pen, 5½ inches, metal handle.
  - No. 1132 Compass, 6 inches, replaceable needle points, one changeable steel point, pen, pencil parts and lengthening bar, improved pivot joint, straightening device, metal handle with reserve needle points.
  - No. 1131 Hairspring Divider, 5¾ inches, replaceable steel points.
  - No. 1150 New Style Circular Spring Bow Divider, 4¼ inches, center wheel adjustment, replaceable steel points.
  - No. 1151 New Style Circular Spring Bow Pen, 4¼ inches, center wheel adjustment.
  - No. 1152 New Style Circular Spring Bow Pencil, 4¼ inches, center wheel adjustment, combination key and lead box.
- Improved silk velvet pocketbook case.....PER SET



## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued



1162

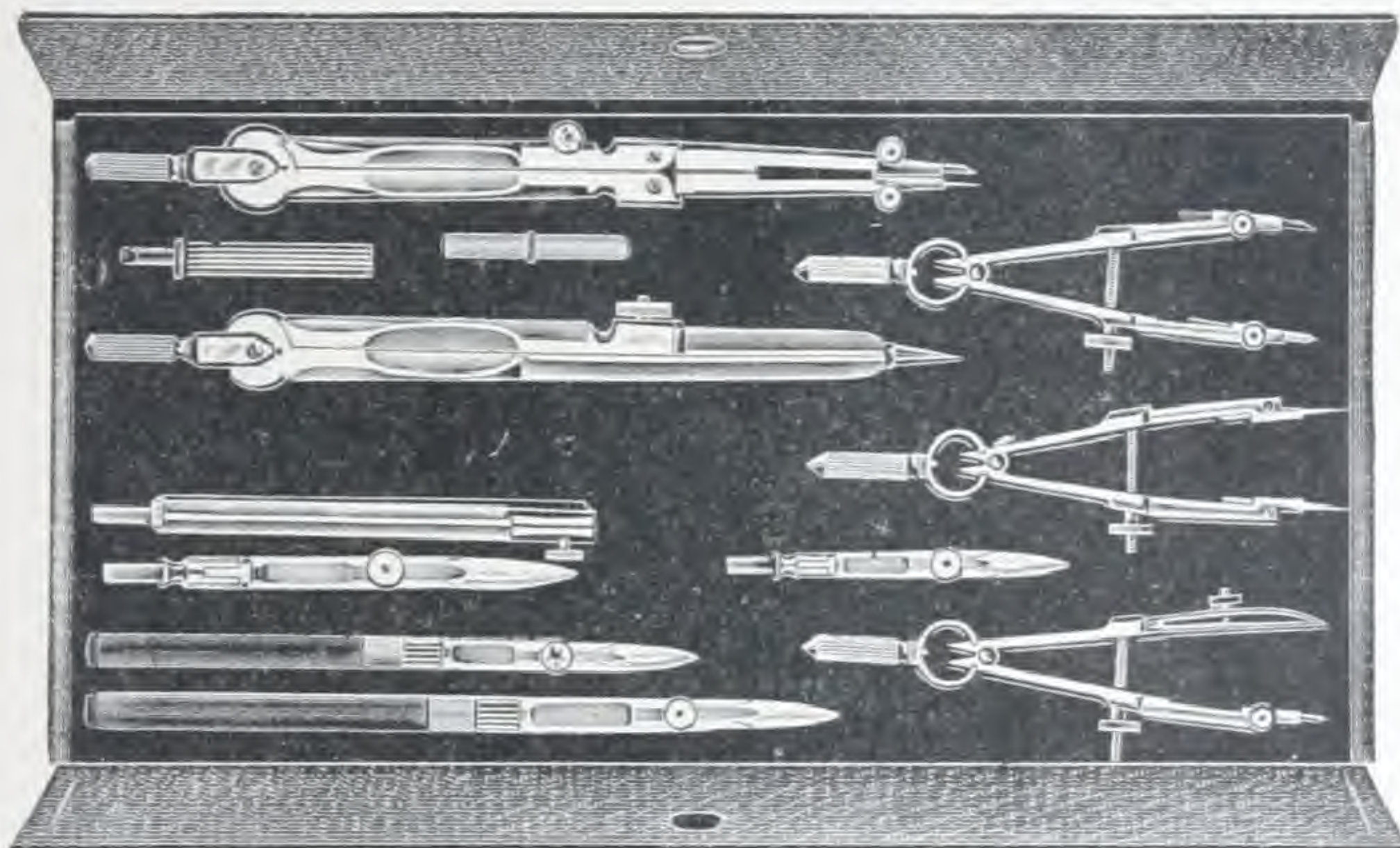
## 1162 Containing:

- No. 1100 Ruling Pen,  $4\frac{1}{2}$  inches, ebony handle.
- No. 1101 Ruling Pen, 5 inches, ebony handle.
- No. 1132 Compass, 6 inches, replaceable needle point, changeable steel point, pen, pencil part and lengthening bar, improved pivot joint, str-ightening device, metal handle with reserve needle points.
- No. 1131 Hairspring Divider,  $5\frac{3}{4}$  inches, replaceable steel points, improved pivot joint, straightening device.
- No. 1154 Bow Divider,  $4\frac{1}{4}$  inches, center wheel adjustment, replaceable needle points.
- No. 1154A Bow Pen,  $4\frac{1}{4}$  inches, center wheel adjustment, replaceable needle point.
- No. 1154B Bow Pencil,  $4\frac{1}{4}$  inches, center wheel adjustment, replaceable needle point.  
Drawing Pencil 4H.  
Combination key and lead box.

Folding Pocketbook Case.....PER SET



## EXTRA FINE GERMAN DRAWING INSTRUMENTS—Continued



1163

**1163** Containing:

No. 1100 Ruling Pen, 4½ inches, ebony handle.

No. 1101 Ruling Pen, 5 inches, ebony handle.

Compass, 6 inches, with pen, pencil, lengthening bar, and straightening device.

Hairspring Divider, 5½ inches, adjustable needle points, and straightening device.

No. 1155 Circular Spring Bow Divider, 3¾ inches, adjustable needle points.

No. 1156 Circular Spring Bow Pen, 3¾ inches, adjustable needle point.

No. 1157 Circular Spring Bow Pencil, 3¾ inches, adjustable needle point.  
Combined screw driver and lead case, metal box containing extra needle points.

Folding Pocketbook Case.....PER SET



## FINE GERMAN DRAWING INSTRUMENTS

OF GERMAN SILVER AND BEST STEEL

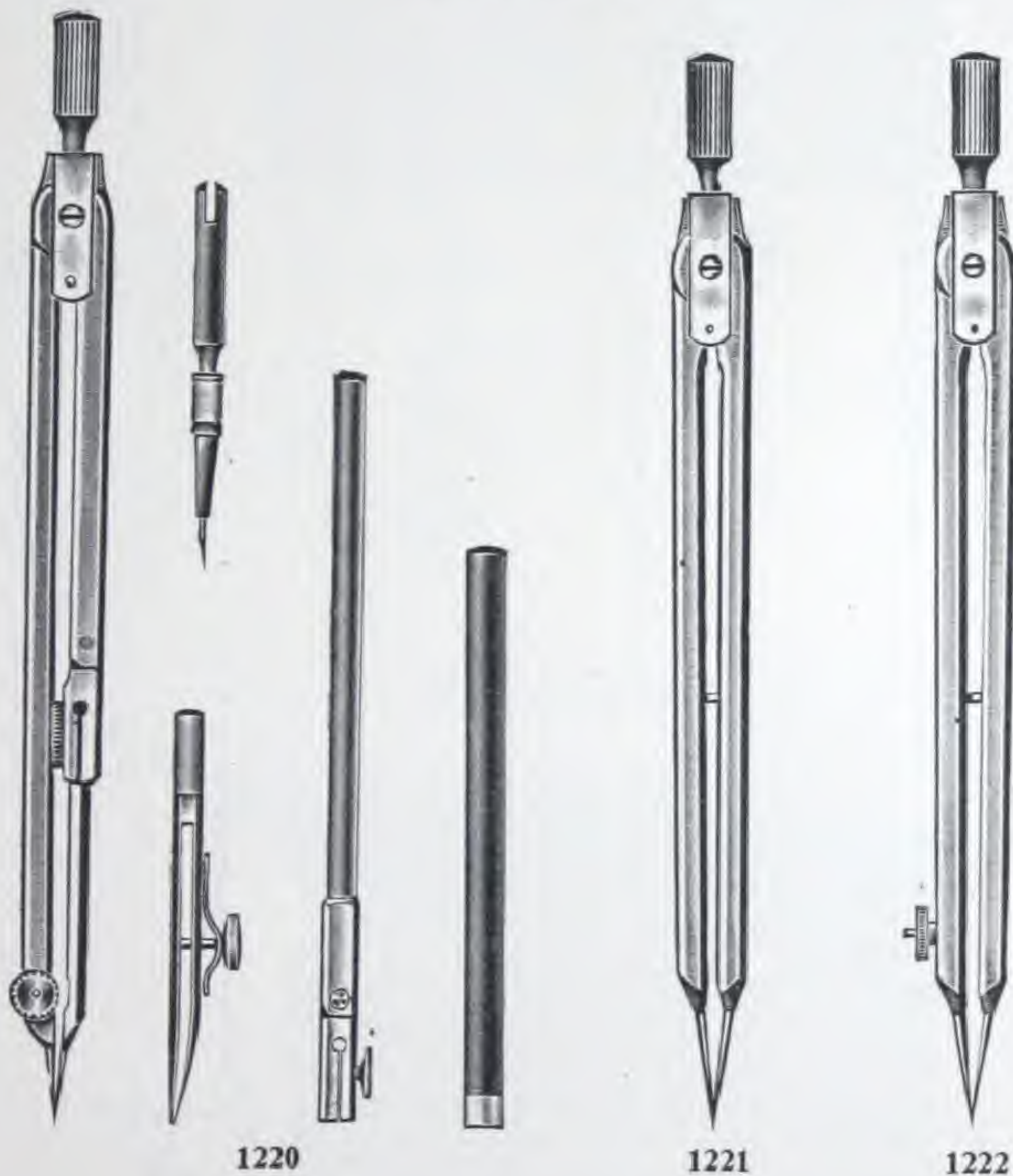
Illustrations  $\frac{2}{3}$  Size.

- EACH
- 1200** Ruling Pen,  $4\frac{1}{2}$  inches, spring blade, ebony handle. . . . .  
**1201** Ruling Pen, 5 inches, spring blade, ebony handle. . . . .  
**1202** Ruling Pen,  $5\frac{1}{2}$  inches, spring blade, ebony handle. . . . .  
**1203** Ruling Pen,  $4\frac{1}{2}$  inches, spring blade, aluminum handle. . . . .  
**1204** Ruling Pen, 5 inches, spring blade, aluminum handle. . . . .  
**1205** Ruling Pen,  $5\frac{1}{2}$  inches, spring blade, aluminum handle. . . . .  
**1209** Hatching Pen, 5 inches, three pairs of blades, ebony handle, in  
 leather case. . . . .

Ruling Pens Nos. 1200 to 1205 furnished with the patent release if desired.



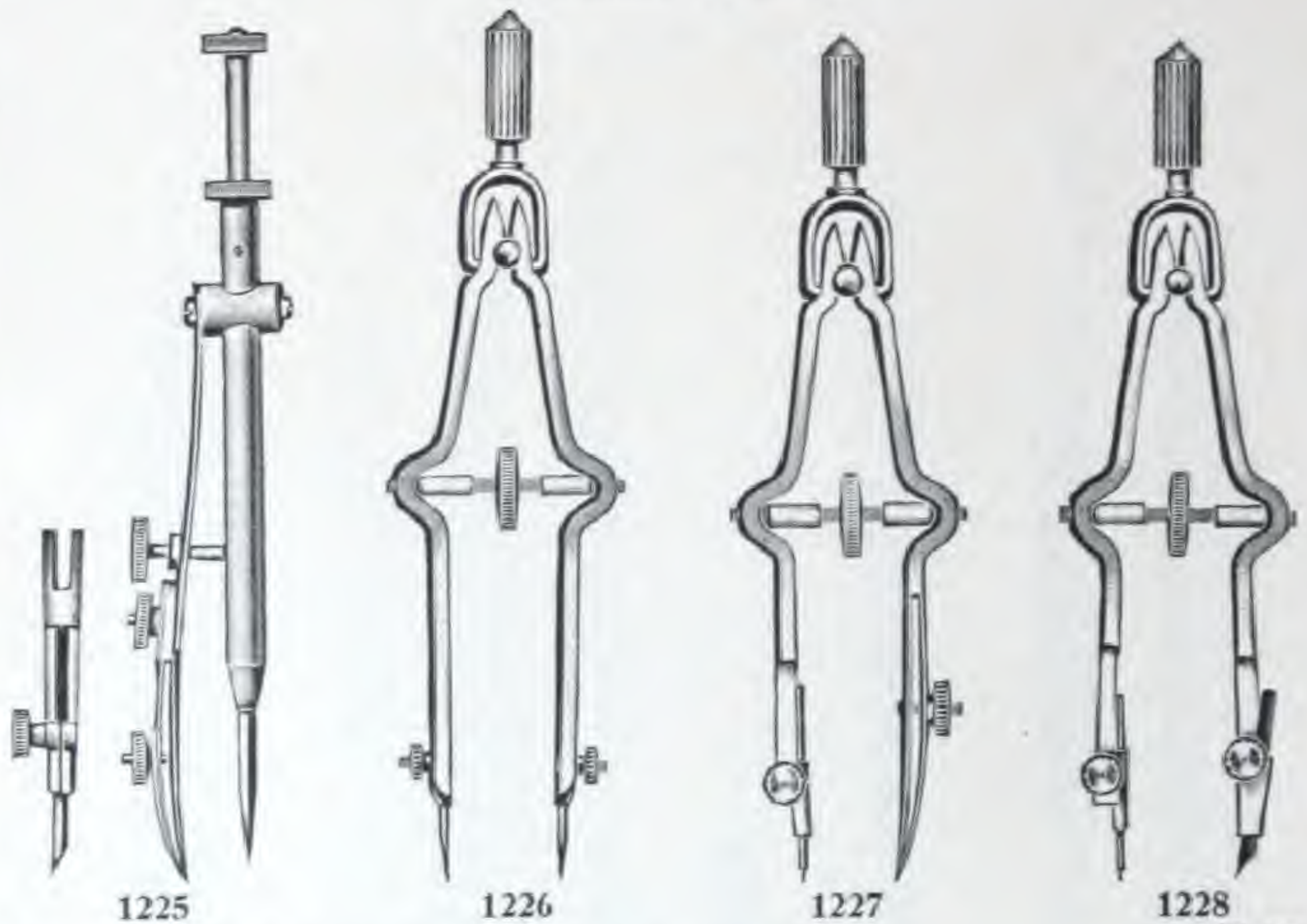
## FINE GERMAN DRAWING INSTRUMENTS—Continued

Illustration  $\frac{2}{3}$  Size

- 1220 Compasses, 6 inches, replaceable needle point, one steel point, pen, pencil parts and lengthening bar, metal handle.....
- 1221 Plain Divider,  $5\frac{3}{4}$  inches.....
- 1222 Hairspring Divider,  $5\frac{3}{4}$  inches.....
- EACH

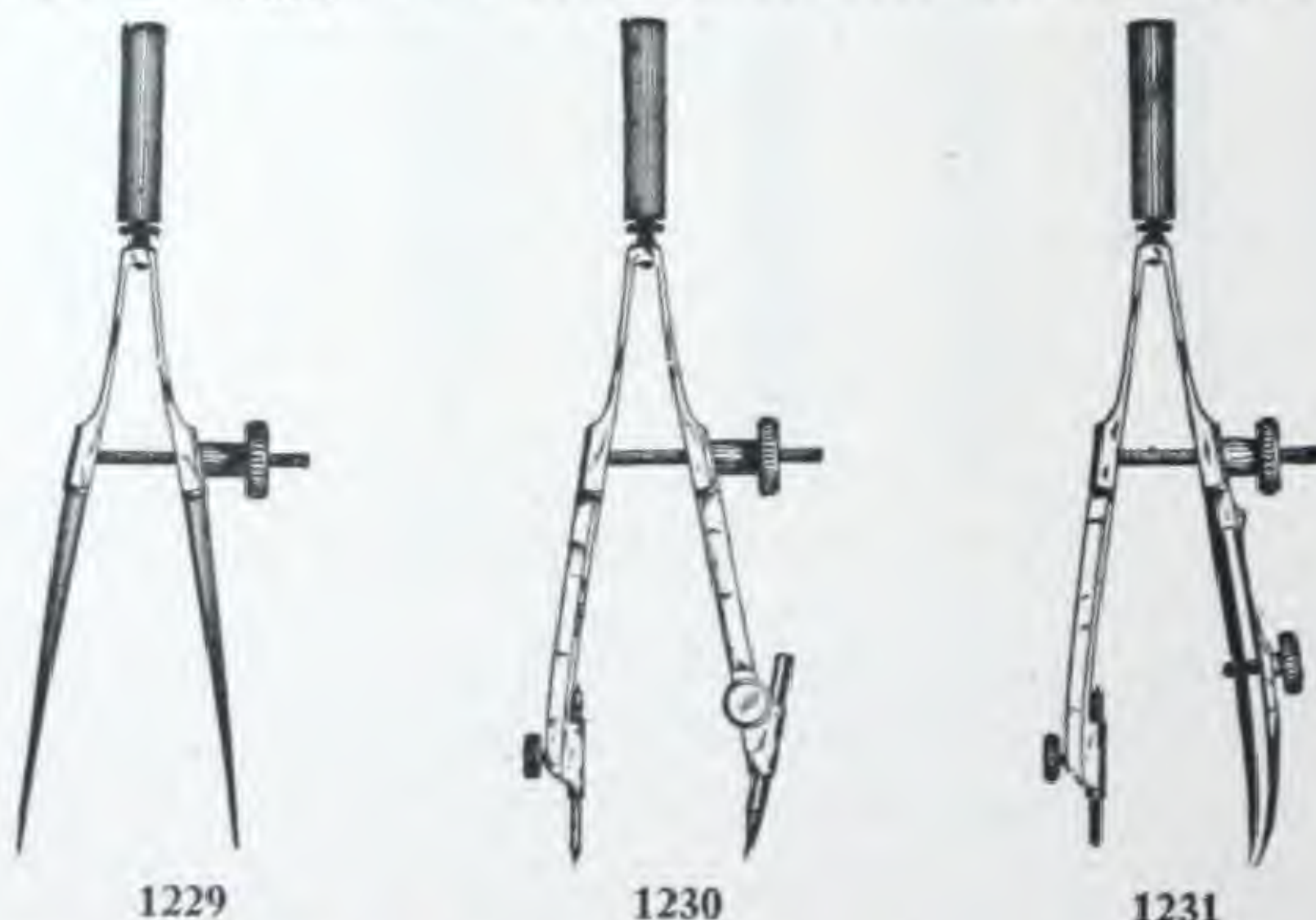


## FINE GERMAN DRAWING INSTRUMENTS—Continued

Illustration  $\frac{3}{4}$  Size

- 1225 Drop Spring Bow Pen, with pencil attachment.....  
 1226 Bow Divider,  $3\frac{3}{4}$  inches, replaceable needle points.....  
 1227 Bow Pen,  $3\frac{3}{4}$  inches.....  
 1228 Bow Pencil,  $3\frac{3}{4}$  inches.....

EACH

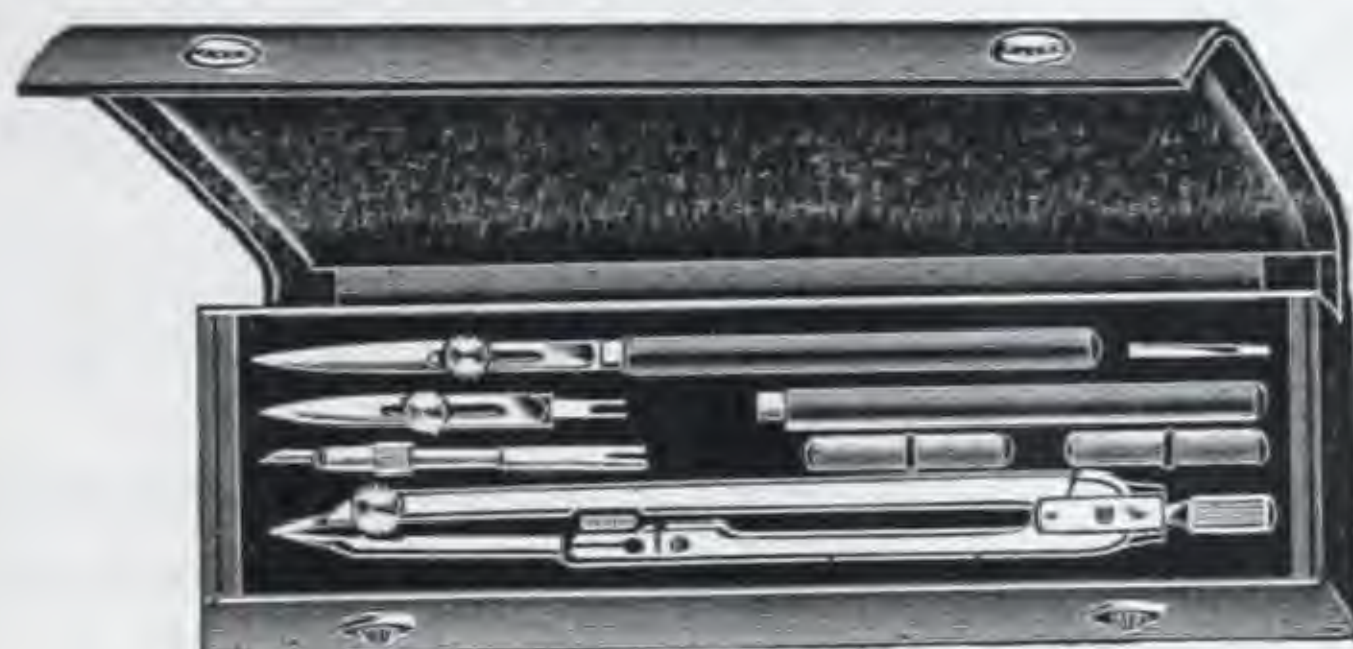


- 1229 Bow Divider,  $3\frac{1}{2}$  inches, .....  
 1230 Bow Pen,  $3\frac{1}{2}$  inches.....  
 1231 Bow Pencil,  $3\frac{1}{2}$  inches.....

EACH



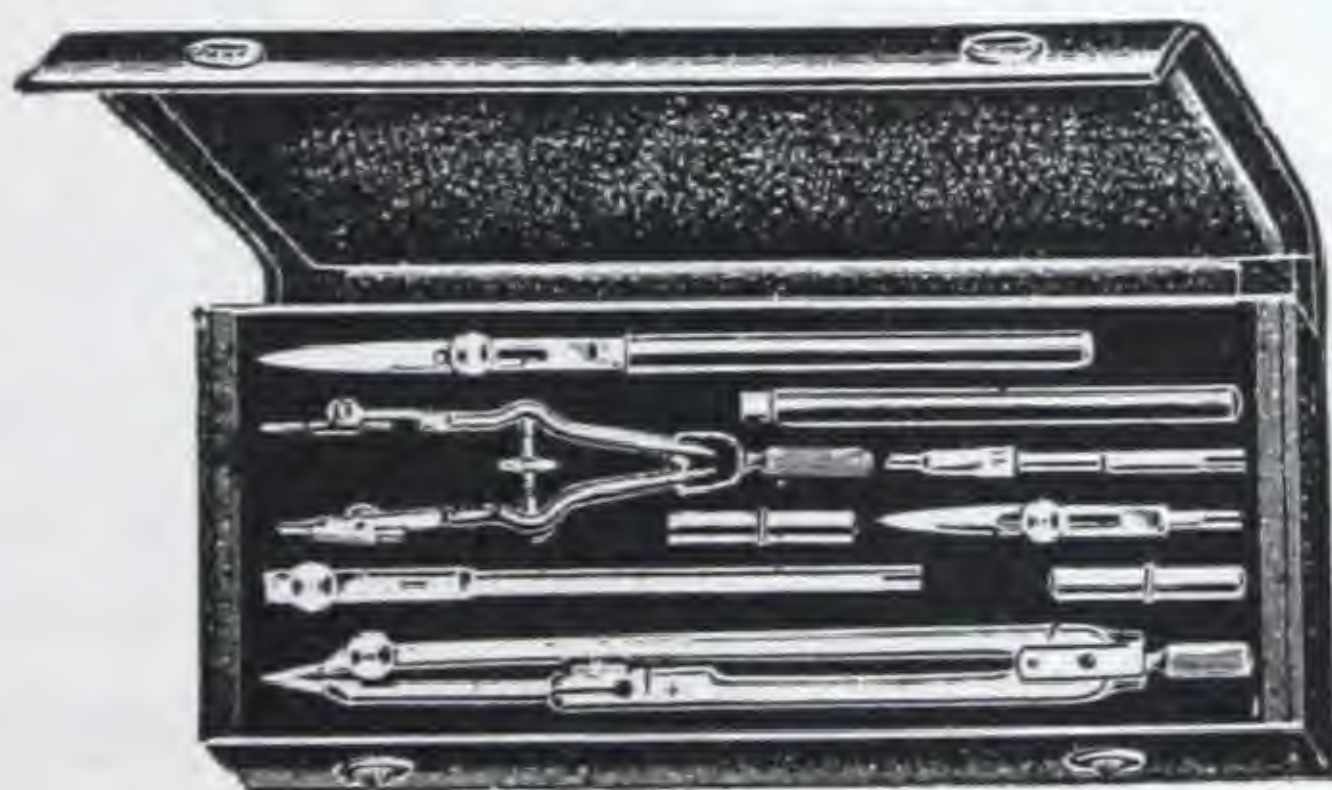
## FINE GERMAN DRAWING INSTRUMENTS—Continued

Illustration  $\frac{1}{3}$  Size

1234

## 1234 Containing:

- No. 1202 Ruling Pen,  $5\frac{1}{2}$  inches, metal handle.  
 No. 1220 Compass, 6 inches, replaceable needle points, pen, pencil part, and lengthening bar, metal handle, and straightening device.  
 No. 1221 Plain Divider,  $5\frac{3}{4}$  inches, with straightening device.  
 Box with reserve needle points.  
 Box with reserve leads.  
 Improved Pocketbook case .....PER SET

Illustration  $\frac{1}{3}$  Size

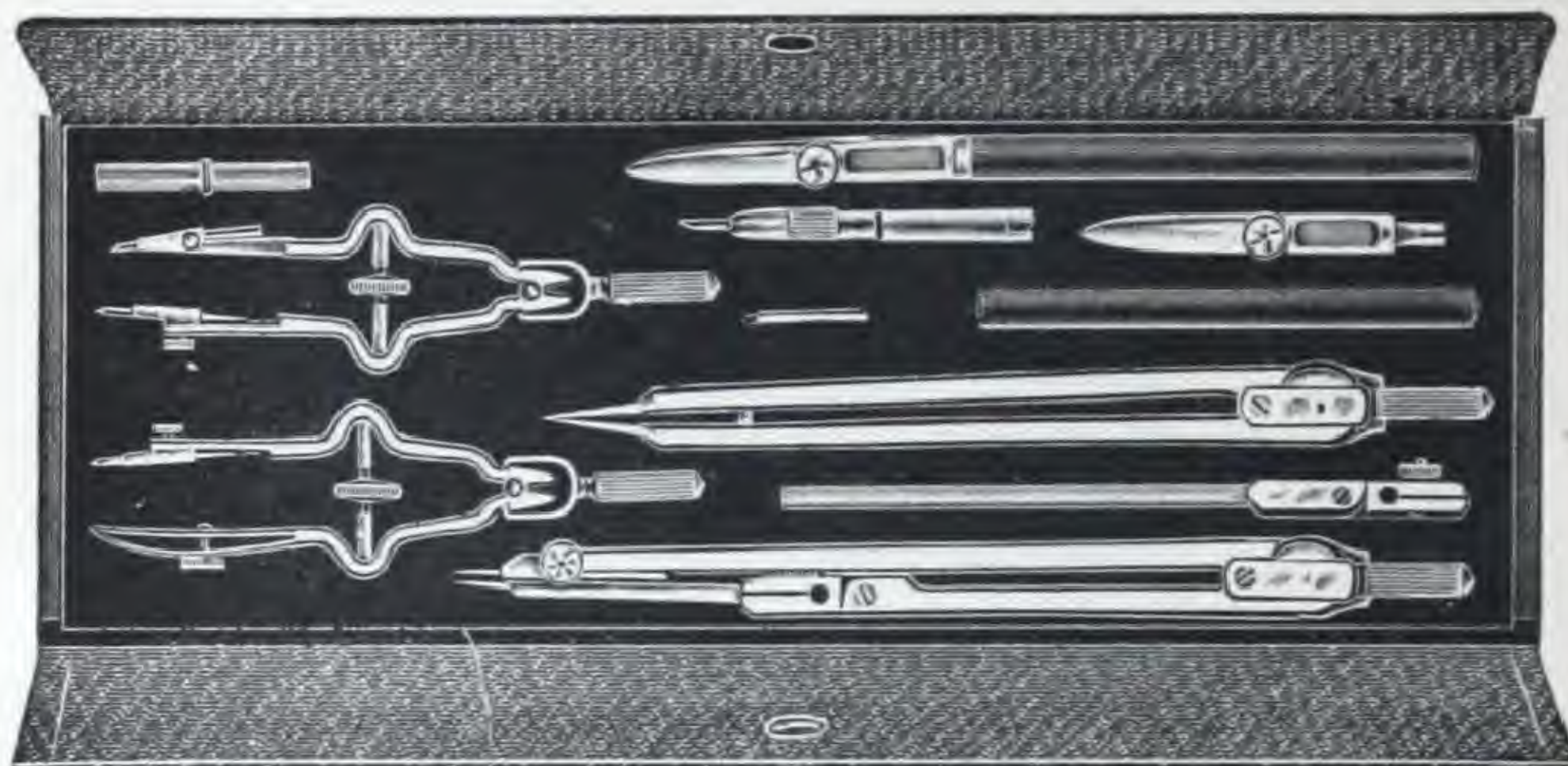
1235

## 1235 Containing:

- No. 1220 Compasses, 6 inches, replaceable needle point, steel point, pen, pencil parts and lengthening bar, metal handle, improved pivot joint, straightening device.  
 No. 1221 Plain Divider,  $5\frac{3}{4}$  inches.  
 No. 1228 New Style Circular Spring Bow Pencil,  $3\frac{1}{2}$  inches.  
 No. 1202 Ruling Pen,  $5\frac{1}{2}$  inches, metal handle.  
 Box with reserve needle points.  
 Box with leads.  
 Improved Pocketbook Case .....PER SET



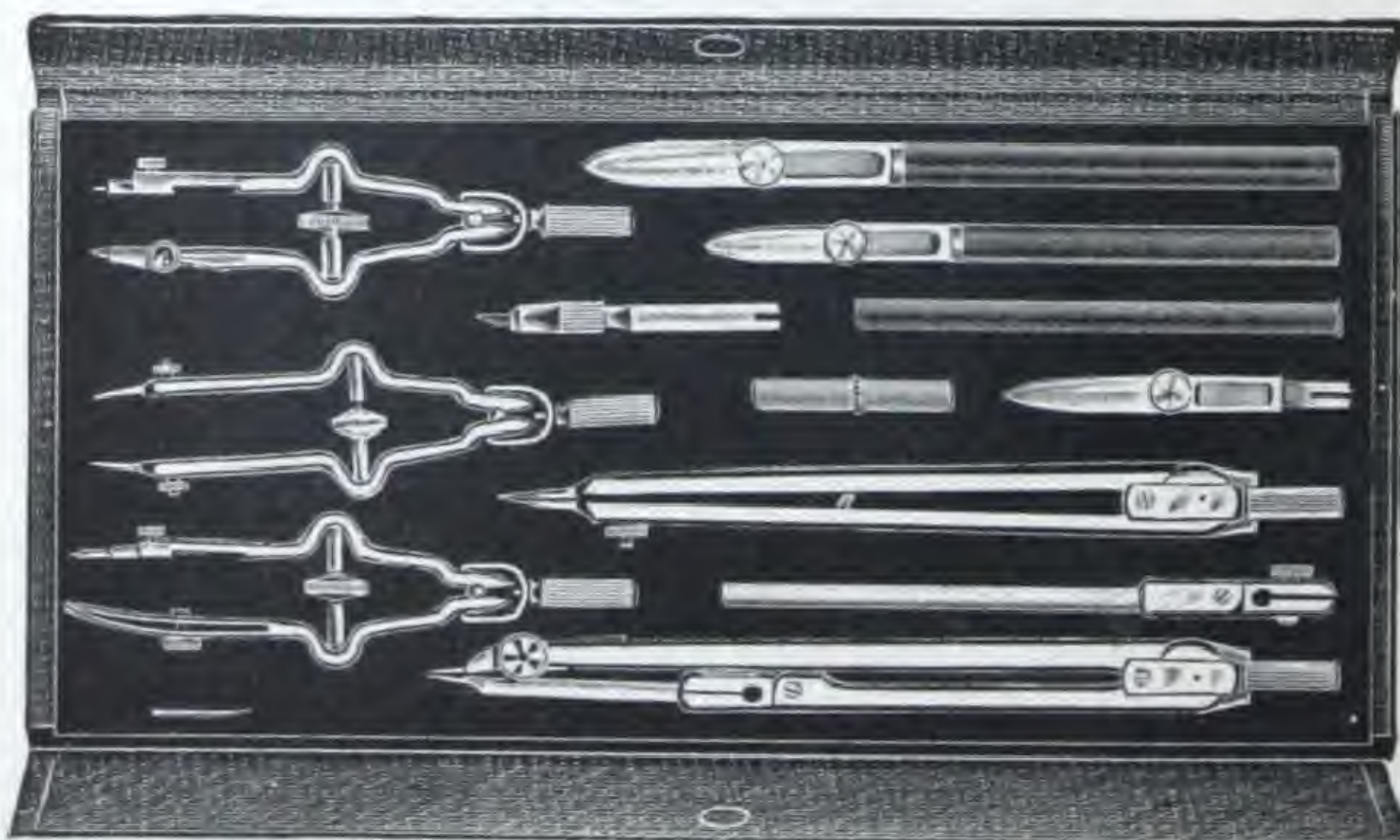
## FINE GERMAN DRAWING INSTRUMENTS—Continued

Illustration  $\frac{1}{3}$  Size

## 1236

1236 Containing:

- No. 1220 Compasses, 6 inches, replaceable needle point, steel point, pen, pencil parts and lengthening bar, metal handle, improved pivot joint, straightening device.
- No. 1221 Plain Divider,  $5\frac{3}{4}$  inches.
- No. 1227 New Style Circular Spring Bow Pen,  $3\frac{1}{2}$  inches.
- No. 1228 New Style Circular Spring Bow Pencil,  $3\frac{1}{2}$  inches.
- No. 1202 Ruling Pen,  $5\frac{1}{2}$  inches, metal handle.  
 Box with reserve needle points.  
 Box with leads.  
 Improved Pocketbook Case.....PER SET

Illustration  $\frac{1}{3}$  Size

## 1237

For description see next page

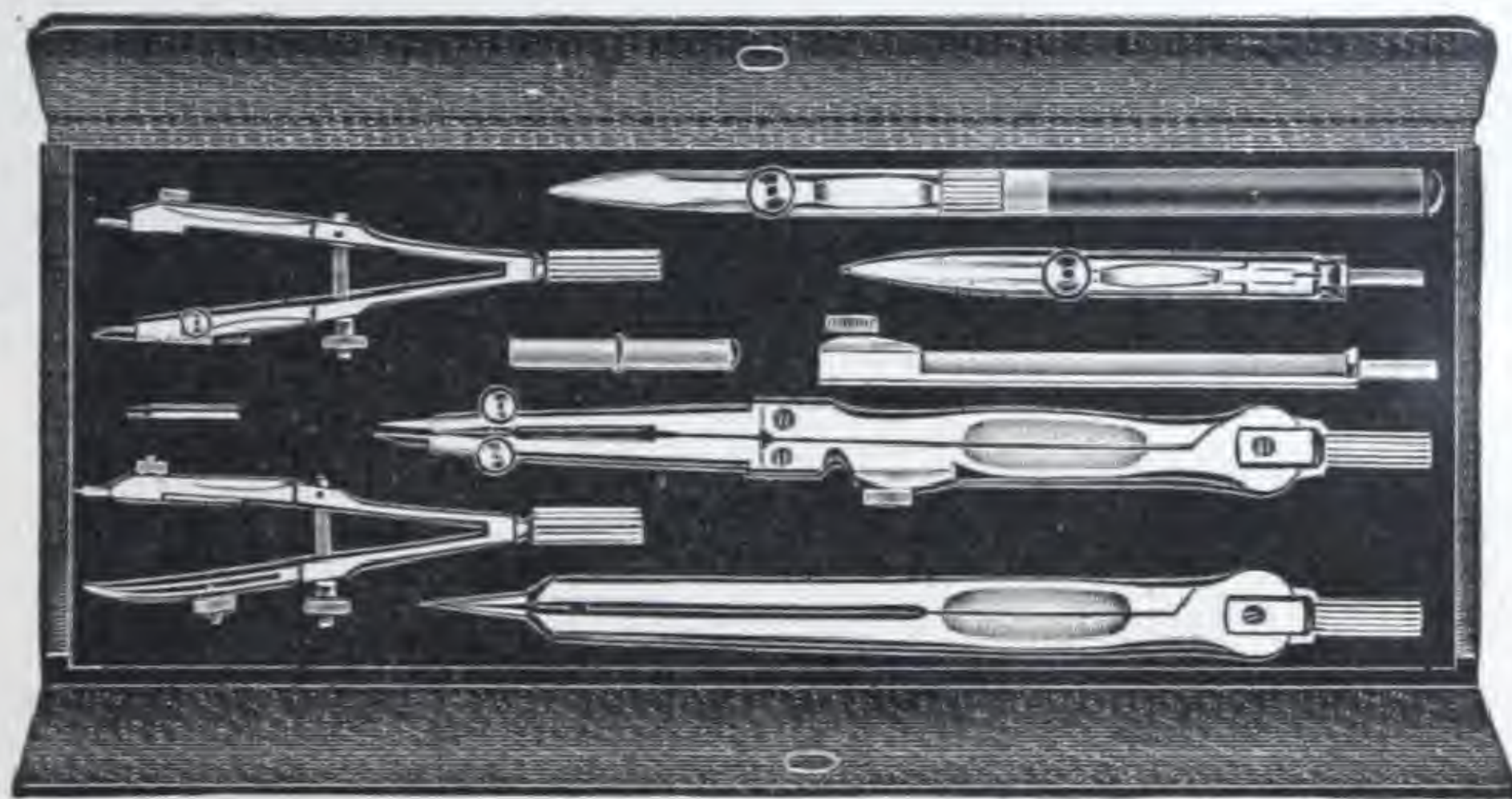


## FINE GERMAN DRAWING INSTRUMENTS—Continued

## 1237 Containing:

- No. 1220 Compasses, 6 inches, replaceable needle point, steel point, pen, pencil parts and lengthening bar, metal handle, improved pivot joint, straightening device.
- No. 1222 Hairspring Divider,  $5\frac{3}{4}$  inches.
- No. 1226 New Style Circular Spring Bow Spacer,  $3\frac{1}{2}$  inches.
- No. 1227 New Style Circular Spring Bow Pen,  $3\frac{1}{2}$  inches.
- No. 1228 New Style Circular Spring Bow Pencil,  $3\frac{1}{2}$  inches.
- No. 1202 Ruling Pen,  $5\frac{1}{2}$  inches, metal handle.
- No. 1200 Ruling Pen,  $4\frac{1}{2}$  inches, metal handle.  
Box with reserve needle points.  
Box with leads and key.  
Improved Pocketbook Case.....PER SET

1238 Same as set No. 1237, with only one ruling pen.....PER SET



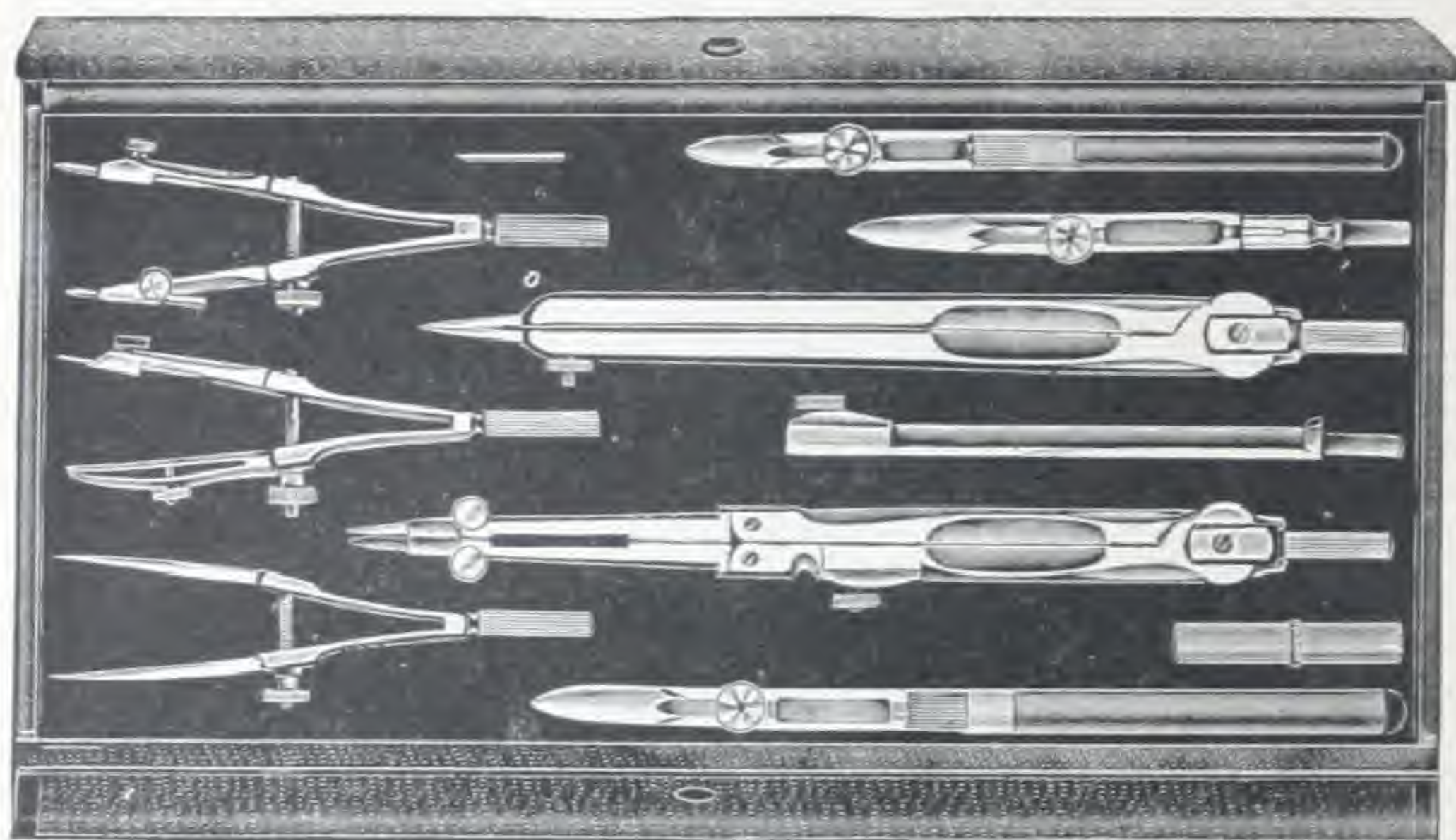
## 1239

## 1239 Containing:

- No. 1202 Ruling Pen,  $5\frac{1}{2}$  inches, ebony handle.  
Compass, 6 inches, replaceable needle point, pen, pencil part and lengthening bar, straightening device.  
Plain Divider,  $5\frac{3}{4}$  inches, straightening device.  
Bow Pen,  $3\frac{1}{2}$  inches.  
Bow Pencil,  $3\frac{1}{2}$  inches.  
Metal Box, with reserve leads.  
Folding Pocketbook Case.....PER SET



## FINE GERMAN DRAWING INSTRUMENTS—Continued



## 1240

## 1240 Containing:

No. 1200 Ruling Pen,  $4\frac{1}{2}$  inches, ebony handle.

No. 1202 Ruling Pen,  $5\frac{1}{2}$  inches, ebony handle.

Compass, 6 inches, adjustable needle point, pen, pencil, lengthening bar, and straightening device.

Hairspring Divider,  $5\frac{3}{4}$  inches with straightening device.

Bow Divider,  $3\frac{1}{2}$  inches.

Bow Pen,  $3\frac{1}{2}$  inches.

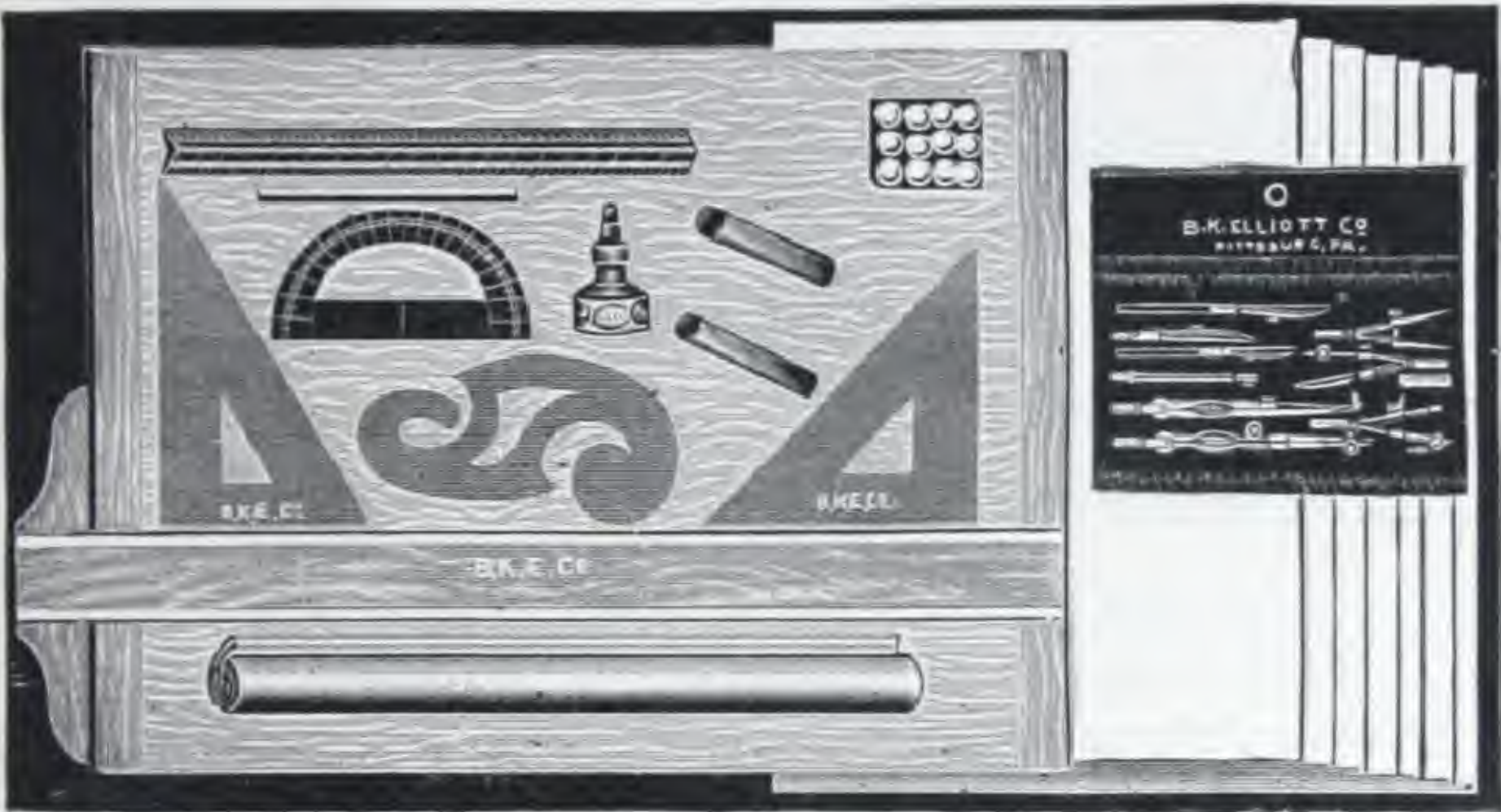
Bow Pencil,  $3\frac{1}{2}$  inches.

Reserve Lead Box.

Folding Pocketbook Case.....PER SET



STUDENTS' DRAWING OUTFITS



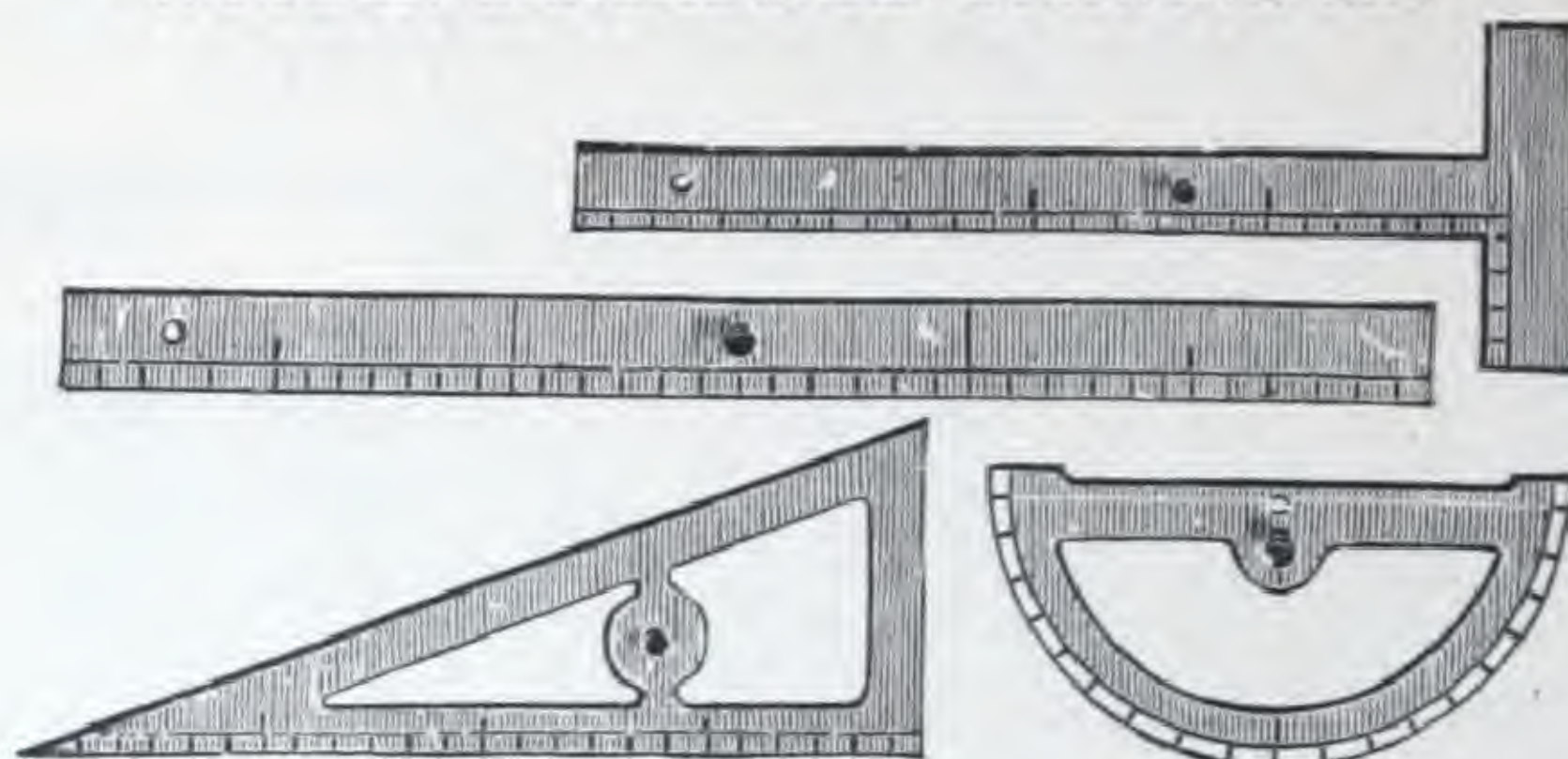
1282

These outfits are intended for students of the various correspondence schools giving instructions in civil, mechanical and electrical engineering. The articles composing the outfit are selected from our regular stock and will be found very serviceable.

- 1281 Consisting of the following:
- 1 Set Drawing Instruments, No. 1237
  - 1 16 x 22 Selected Pine Drawing Board, end ledges flush both sides;
  - 1 T Square, 24 inch, Mahogany, Ebony-lined, fixed Head;
  - 1 Protractor, 6 inch, German Silver;
  - 1 Triangular Boxwood Scale, 12 inch, highest grade;
  - 1 Curve, Amber, No. 16;
  - 1 30 x 60 degree Triangle, Amber, 9 inch;
  - 1 45 degree Triangle, Amber, 7 inch;
  - 1 dozen Steel Thumb Tacks, 3/8-inch diameter;
  - 1 4H Kohinoor Pencil;
  - 1 3/4-ounce bottle Higgins' Waterproof Black Ink;
  - 1 Pencil Eraser, Faber's;
  - 1 Ink Eraser, Faber's;
  - 2 sheets Tracing Cloth, 16 x 22 inches;
  - 6 sheets Whatman Paper, Demy, 15 x 20 inches;
  - Outfit complete, each.....
- 1282 Same as above, but with Set of Instruments No. 1240 in place of 1237 each.....



## WOODEN BLACKBOARD DRAWING SET



PER SET

- 2283 Wooden Blackboard Drawing Set, consisting of 24-inch T Square, 36-inch Straightedge, 24-inch Triangle, all divided to inches, and 15½-inch Protractor.....

## WOODEN BLACKBOARD DIVIDERS



2284



2287

EACH

- 2284 Wooden Blackboard Divider, 12 inches.....  
 2285 Wooden Blackboard Divider, 15 inches.....  
 2286 Wooden Blackboard Divider, 18 inches.....  
 2287 Wooden Blackboard Divider, with arc, 12 inches.....  
 2288 Wooden Blackboard Divider, with arc, 15 inches.....  
 2289 Wooden Blackboard Divider, with arc, 18 inches.....

## THE INDUSTRIAL DRAWING KIT (Patented)



2292

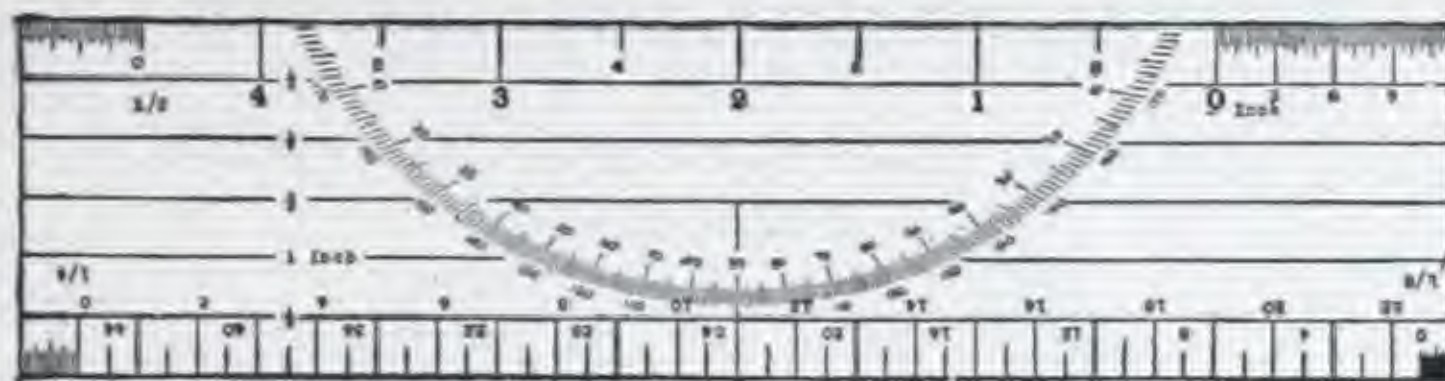
The Industrial Drawing Kit is too well known to need a detailed description. Fig. 1 shows the top side when in use and Fig. 2 the back side with T Squares and Triangles in place.

EACH

- 2290 No. 1, 10 x 12 inches.....  
 2291 No. 2, 13 x 19 inches.....  
 2292 No. 3, 17 x 22 inches.....



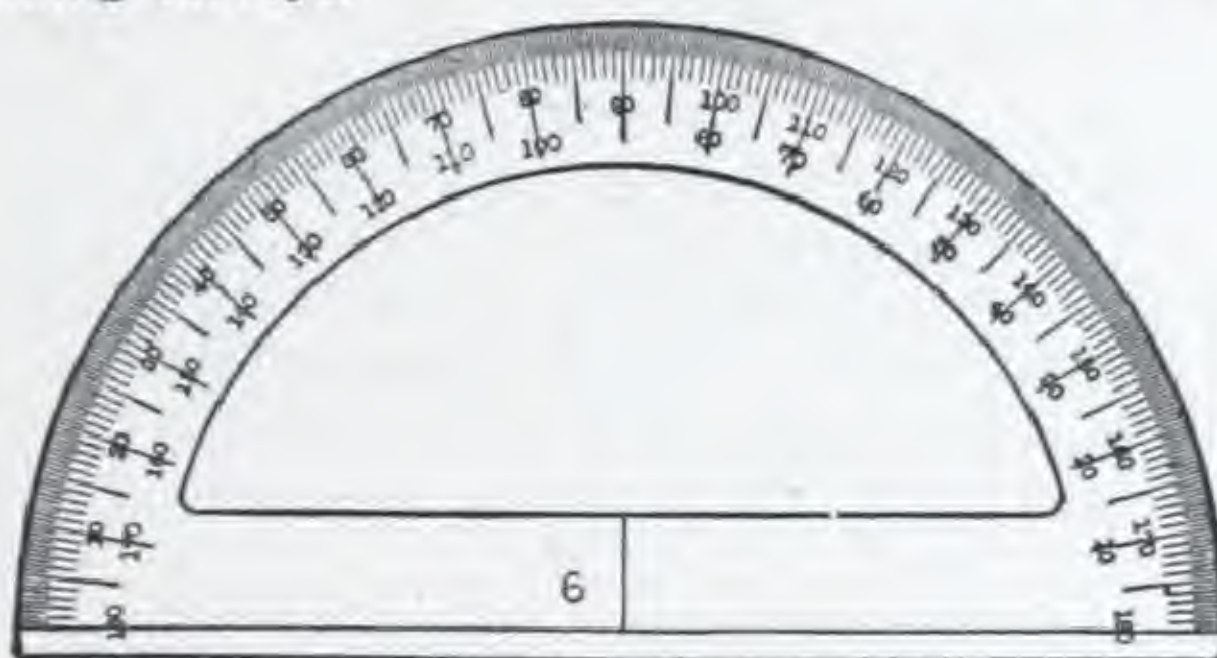
## TRANSPARENT AMBER PROTRACTORS



For Civil Engineers and Surveyors; divided 10 and 20 parts to the inch

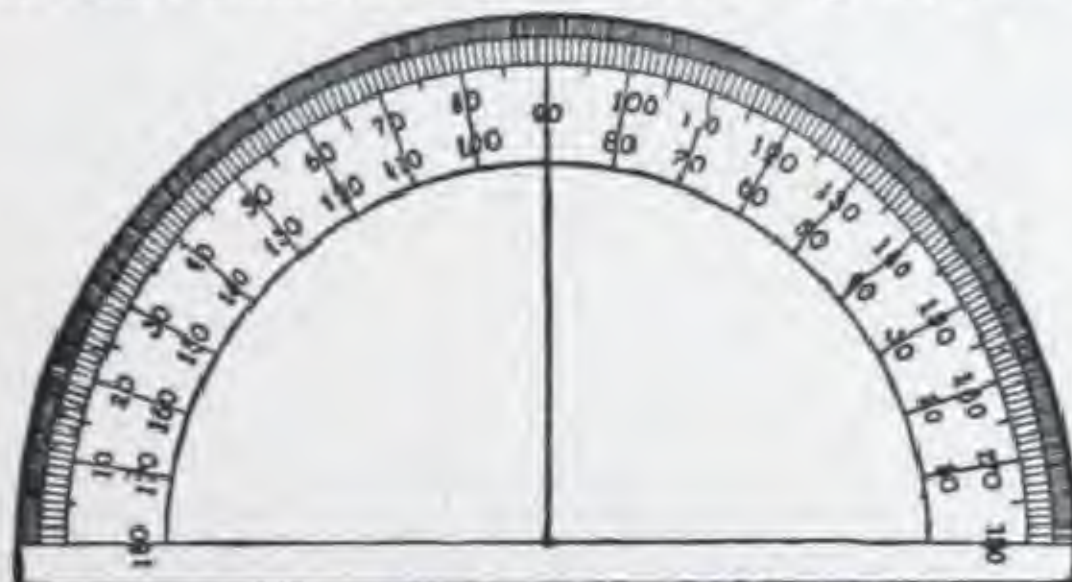
- 2289 Amber Parallel Ruler and Scale Protractor, 10 x 20 scales..... EACH  
 2290 Amber Parallel Ruler and Scale Protractor, 30 x 40 scales.....  
 2291 Amber Parallel Ruler and Scale Protractor, inch and metric scales..  
 2292 Amber Parallel Ruler and Scale Protractor, inch and tenth scales..  
 2293 Amber Parallel Ruler and Scale Protractor,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ,  $\frac{1}{2}$  and 1-inch scales.....

Made of Transparent Amber, 6 inches in length; combines scale and protractor advantages; lines can be drawn at any desired angle or parallel to each other without measuring. An inexpensive and useful protractor for architects, engineers and surveyors. Excellent for recording notes in field, transit or level books when making surveys.



2296

- 2294 Amber Protractor, transparent, half circle,  $\frac{1}{2}$ -degree, 4 inches..... EACH  
 2295 Amber Protractor, transparent, half circle,  $\frac{1}{2}$ -degree, 5 inches.....  
 2296 Amber Protractor, transparent, half circle,  $\frac{1}{2}$ -degree, 6 inches.....  
 2297 Amber Protractor, transparent, half circle,  $\frac{1}{2}$ -degree, 7 inches.....  
 2298 Amber Protractor, transparent, half circle,  $\frac{1}{2}$ -degree, 8 inches.....  
 2299 Amber Protractor, transparent, half circle,  $\frac{1}{2}$ -degree, 9 inches.....  
 2300 Amber Protractor, transparent, circle,  $\frac{1}{2}$ -degree, 6 inches.....



2301

- 2301 Semicircular Amber Protractor, 6 inches, beveled edge,  $\frac{1}{2}$  degree.. EACH  
 2302 Semicircular Amber Protractor, 8 inches, beveled edge,  $\frac{1}{2}$  degree..  
 2303 Circular Amber Protractor, 6 inches, beveled edge,  $\frac{1}{2}$  degree.....  
 2304 Circular Amber Protractor, 8 inches, beveled edge,  $\frac{1}{2}$  degree.....  
 2305 Circular Amber Protractor, 10 inches, beveled edge,  $\frac{1}{2}$  degree.....



## TRANSPARENT AMBER PROTRACTORS—Continued.

## AMBER TRIANGLE PROTRACTORS



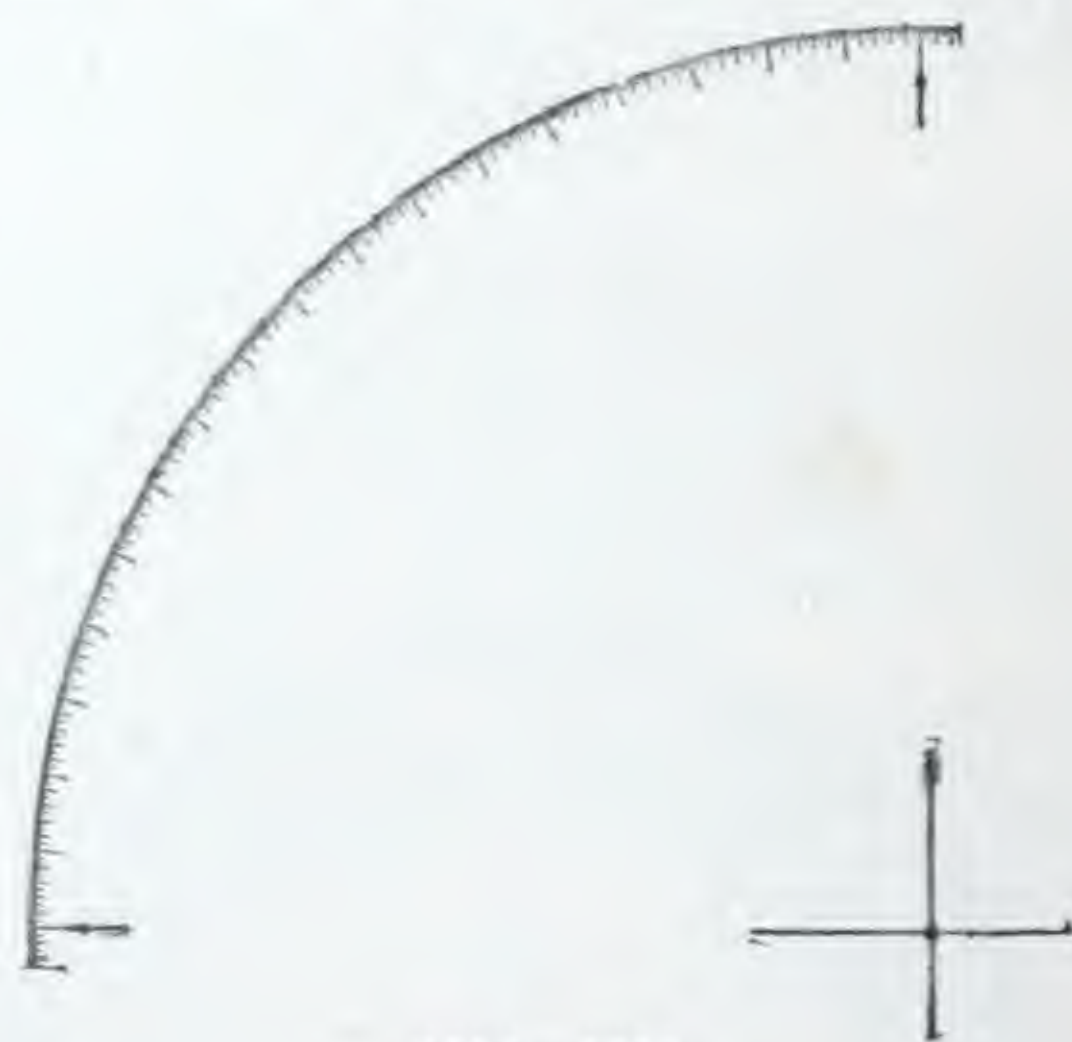
2310



2307

EACH

2306	Amber Triangle Protractor, 45°,	5 inches, div. to 1°.....
2307	Amber Triangle Protractor, 45°,	6 inches, div. to 1°.....
2308	Amber Triangle Protractor, 45°,	7 inches, div. to 1°.....
2309	Amber Triangle Protractor, 30 x 60°,	5 inches, div. to 1°.....
2310	Amber Triangle Protractor, 30 x 60°,	6 inches, div. to 1°.....
2311	Amber Triangle Protractor, 30 x 60°,	7 inches, div. to 1°.....



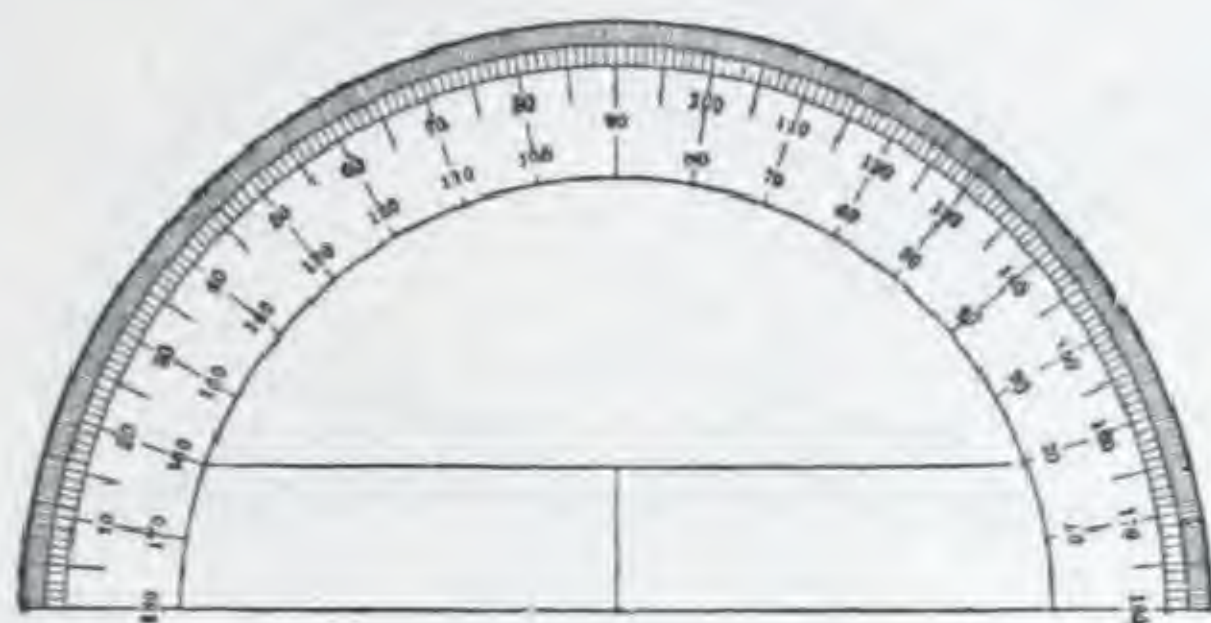
2312—2315

## PAPER PROTRACTORS

2312	Circular Protractor on Drawing Paper, 8-inch diameter, $\frac{1}{2}^\circ$ .....
2313	Circular Protractor on Bristol Board, 8-inch diameter, $\frac{1}{2}^\circ$ .....
2314	Circular Protractor on Drawing Paper, 14-inch diam., $\frac{1}{4}^\circ$ .....
2315	Circular Protractor on Bristol Board, 14-inch diameter, $\frac{1}{4}^\circ$ .....
2316	Circular Protractor on Tracing Paper, 14-inch diameter, $\frac{1}{4}^\circ$ .....



## BRASS PROTRACTORS

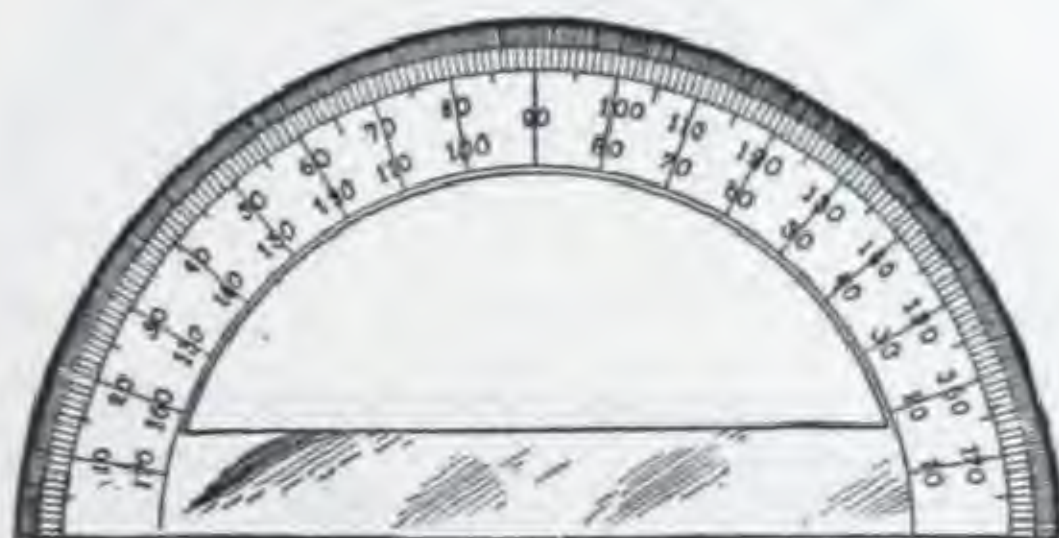


2320

EACH

- 2317 Semicircular, Nickel plated,  $3\frac{1}{2}$ -inch diameter,  $1^\circ$ .....  
 2318 Semicircular, Brass,  $3\frac{1}{2}$ -inch diameter,  $1^\circ$ .....  
 2319 Semicircular, Brass,  $4\frac{1}{4}$ -inch diameter,  $1^\circ$ .....  
 2320 Semicircular, Brass, 5 -inch diameter,  $\frac{1}{2}^\circ$ .....  
 2321 Semicircular, Brass, 6 -inch diameter,  $\frac{1}{2}^\circ$ .....

## GERMAN SILVER PROTRACTORS



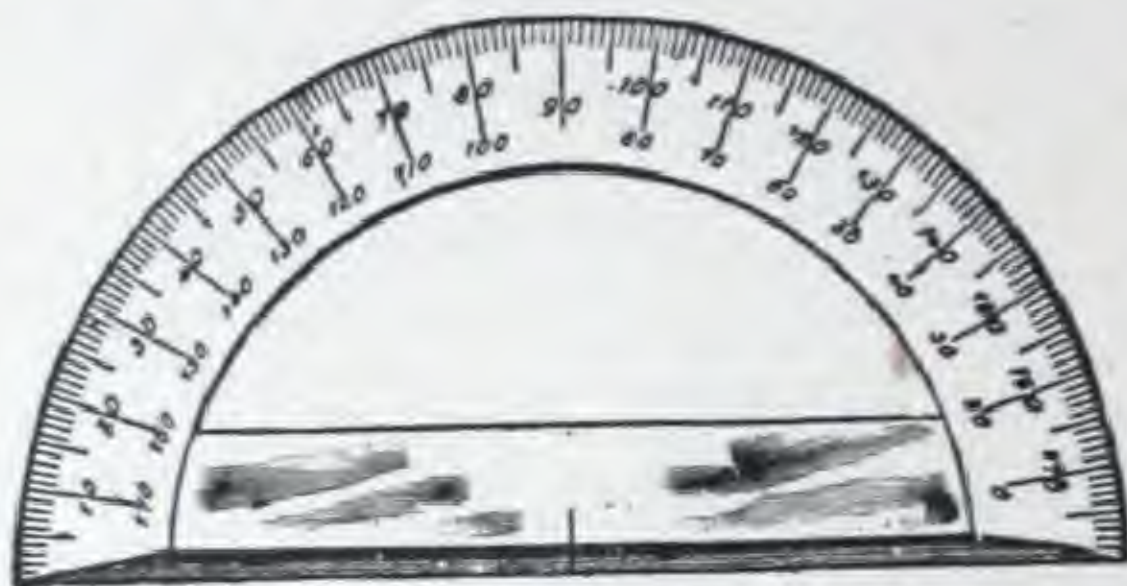
2323

EACH

- 2322 Semicircular, German Silver,  $4\frac{1}{4}$ -inch diameter,  $1^\circ$ .....  
 2323 Semicircular, German Silver, 5 -inch diameter,  $\frac{1}{2}^\circ$ .....  
 2324 Semicircular, German Silver, 6 -inch diameter,  $\frac{1}{2}^\circ$ .....  
 2325 Semicircular, German Silver,  $6\frac{3}{8}$ -inch diameter,  $\frac{1}{2}^\circ$ .....  
 2326 Semicircular, German Silver, 7 -inch diameter,  $\frac{1}{2}^\circ$ .....  
 2327 Semicircular, German Silver, 8 -inch diameter,  $\frac{1}{2}^\circ$ .....



## GERMAN SILVER PROTRACTORS—Continued.

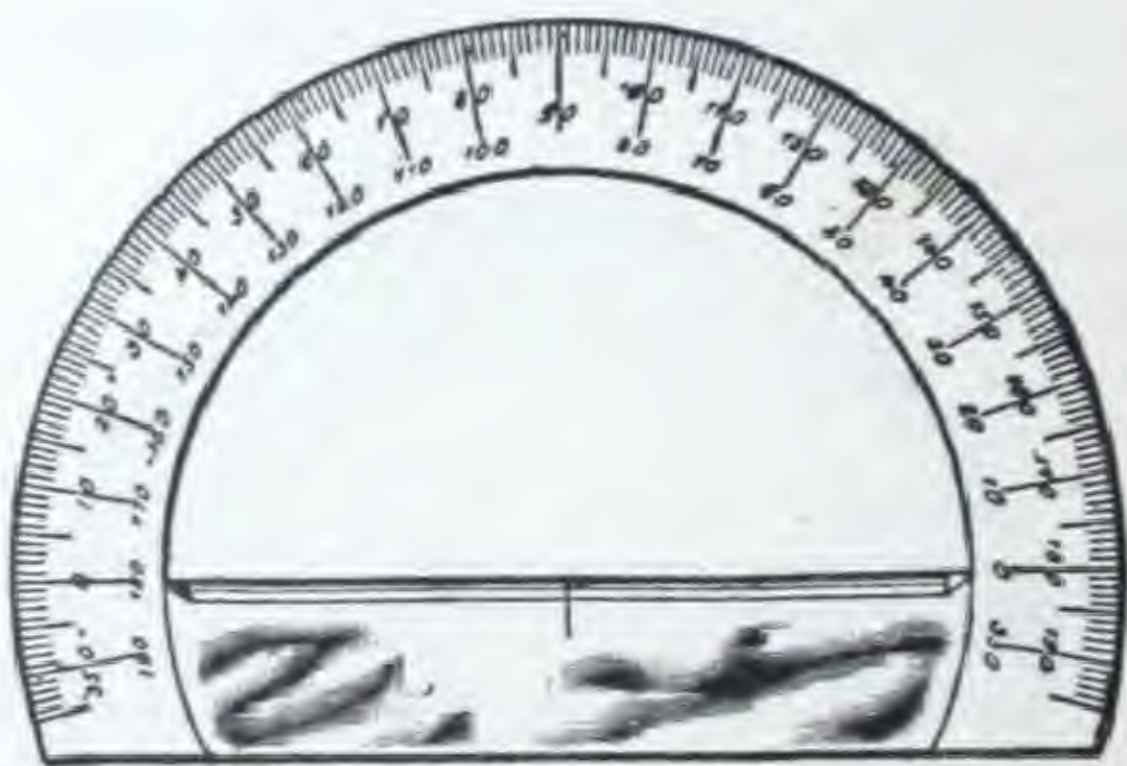


2328

Center on Outer Edge

EACH

- 2328 Semicircular, German Silver, 4 inches, beveled edge,  $1^\circ$ .....
- 2329 Semicircular, German Silver, 5 inches, beveled edge,  $\frac{1}{2}^\circ$ .....
- 2330 Semicircular, German Silver, 6 inches, beveled edge,  $\frac{1}{2}^\circ$ .....
- 2331 Semicircular, German Silver, 6 inches, beveled edge,  $\frac{1}{4}^\circ$ .....
- 2332 Semicircular, German Silver, 7 inches, beveled edge,  $\frac{1}{2}^\circ$ .....
- 2333 Semicircular, German Silver, 8 inches, beveled edge,  $\frac{1}{2}^\circ$ .....



2334

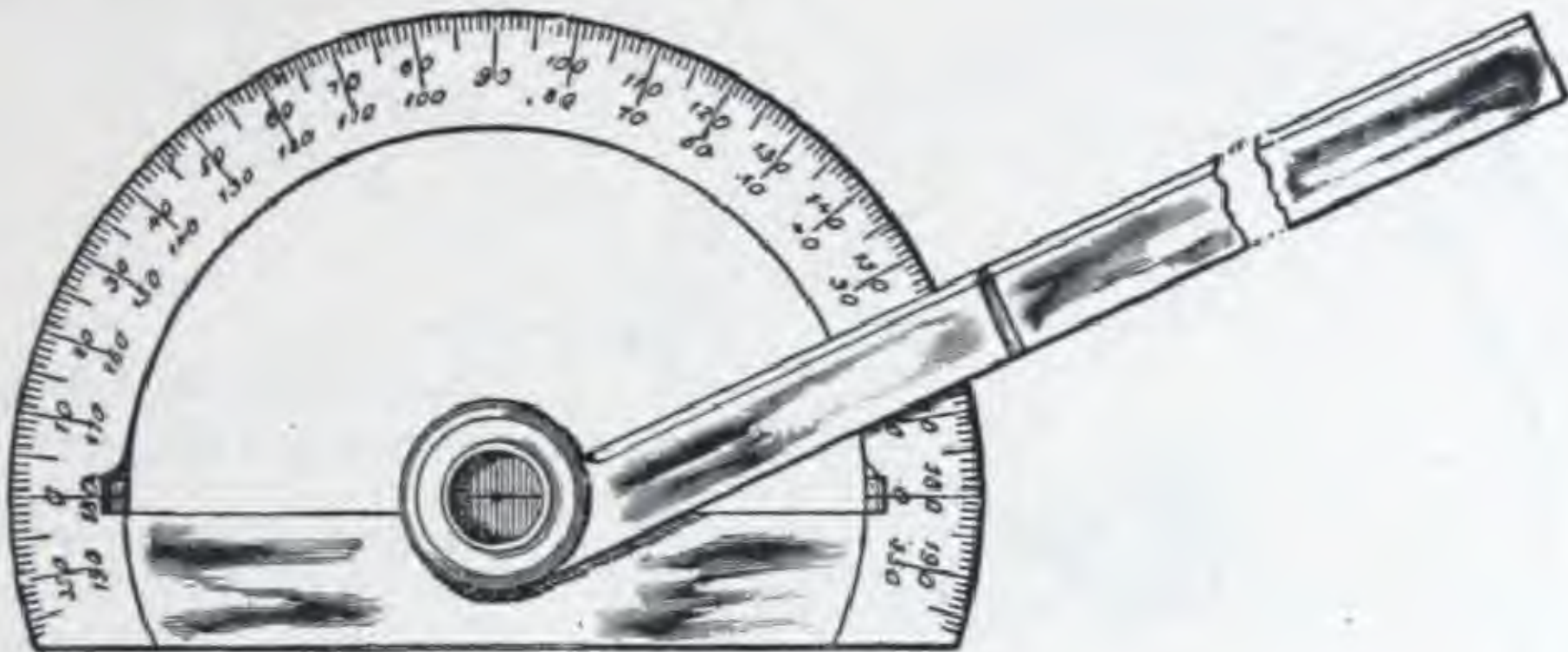
Center on Inner Edge

EACH

- 2334 Semicircular, German Silver, 4 inches, beveled edge,  $1^\circ$ .....
- 2335 Semicircular, German Silver, 5 inches, beveled edge,  $\frac{1}{2}^\circ$ .....
- 2336 Semicircular, German Silver, 6 inches, beveled edge,  $\frac{1}{2}^\circ$ .....
- 2337 Semicircular, German Silver, 6 inches, beveled edge,  $\frac{1}{4}^\circ$ .....



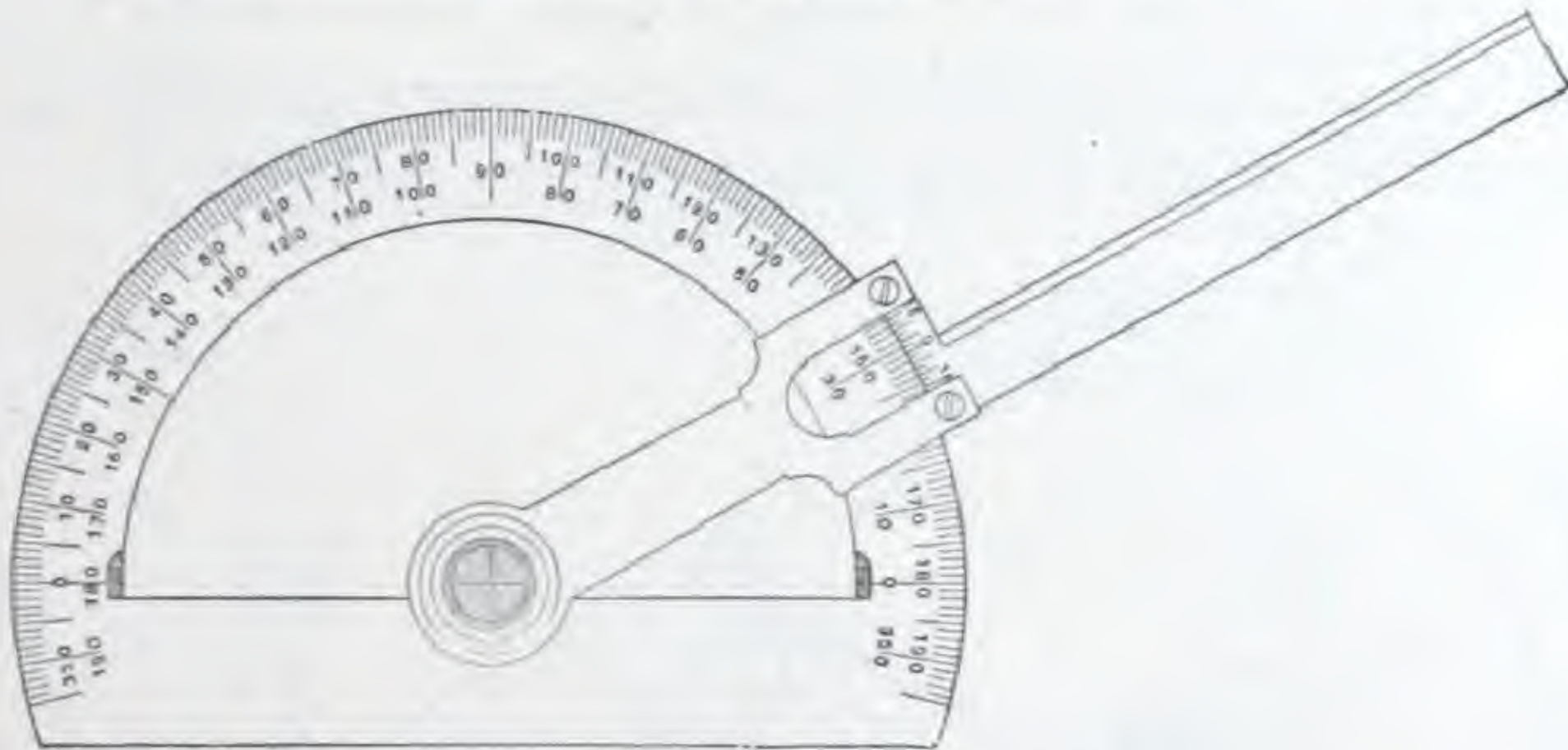
METAL PROTRACTORS—Continued.



2340

Semicircular with Movable Arm and Horn Center EACH

- 2340 Semicircular, German silver, 6 inches,  $\frac{1}{2}$  degrees.  
Length of arm beyond outer edge, 6 inches.
- 2341 Semicircular, German silver, 7 inches,  $\frac{1}{2}$  degrees.  
Length of arm beyond outer edge,  $6\frac{1}{2}$  inches.



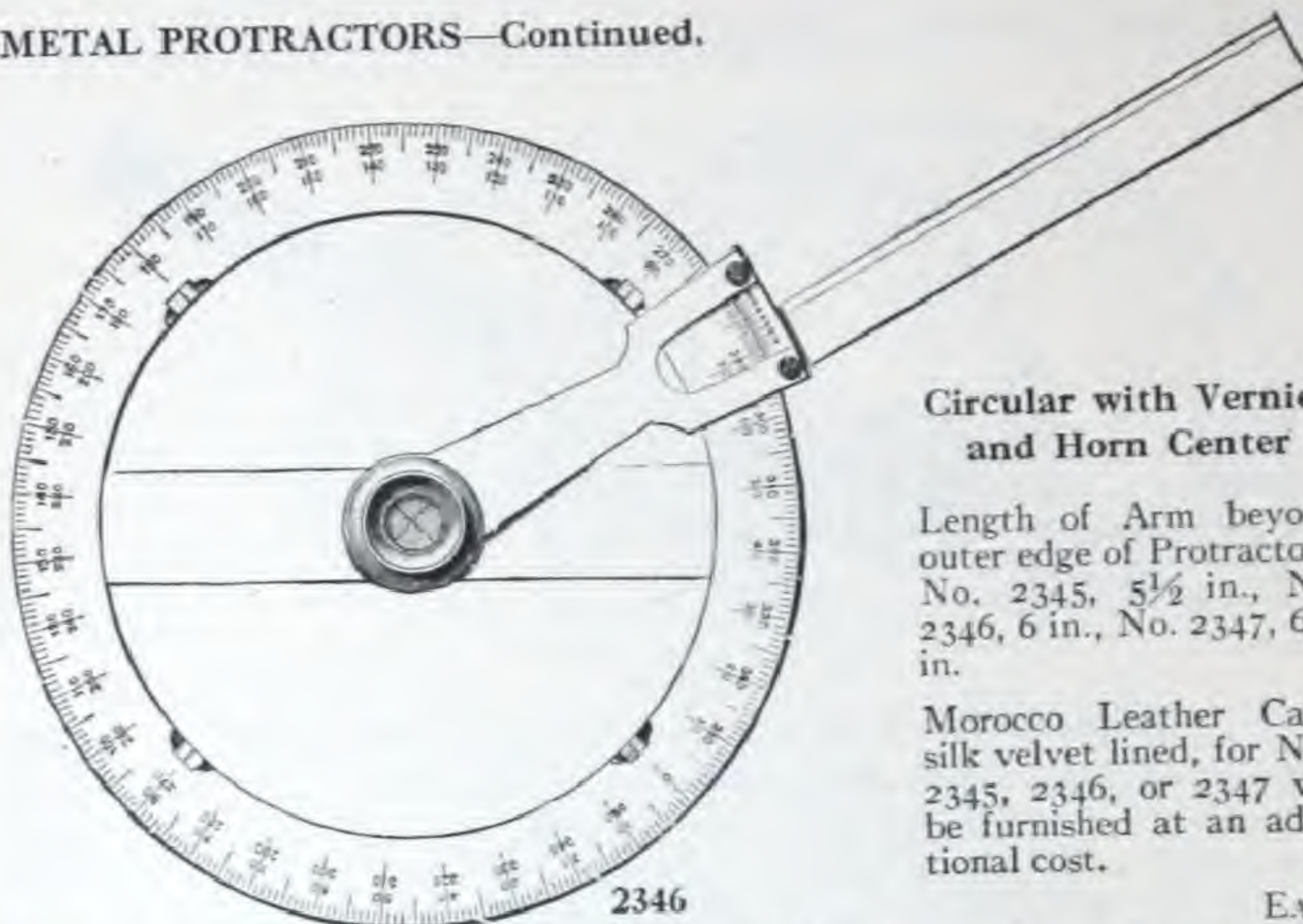
2342

Semicircular with Vernier and Horn Center EACH

- 2342 Semicircular, German silver,  $5\frac{1}{2}$  inches,  $\frac{1}{2}$  degrees, vernier reading to 3 minutes.  
Length of arm beyond outer edge,  $5\frac{1}{2}$  inches.  
Morocco leather case, silk velvet lined.
- 2343 Semicircular, German silver, 8 inches,  $\frac{1}{4}$  degrees, vernier reading to 1 minute.  
Length of arm beyond outer edge, 6 inches.  
Morocco leather case, silk velvet lined.
- 2344 Semicircular, German silver, 10 inches,  $\frac{1}{4}$  degrees, vernier reading to 1 minute.  
Length of arm beyond outer edge,  $6\frac{1}{2}$  inches.  
Morocco leather case, silk velvet lined.



## METAL PROTRACTORS—Continued.

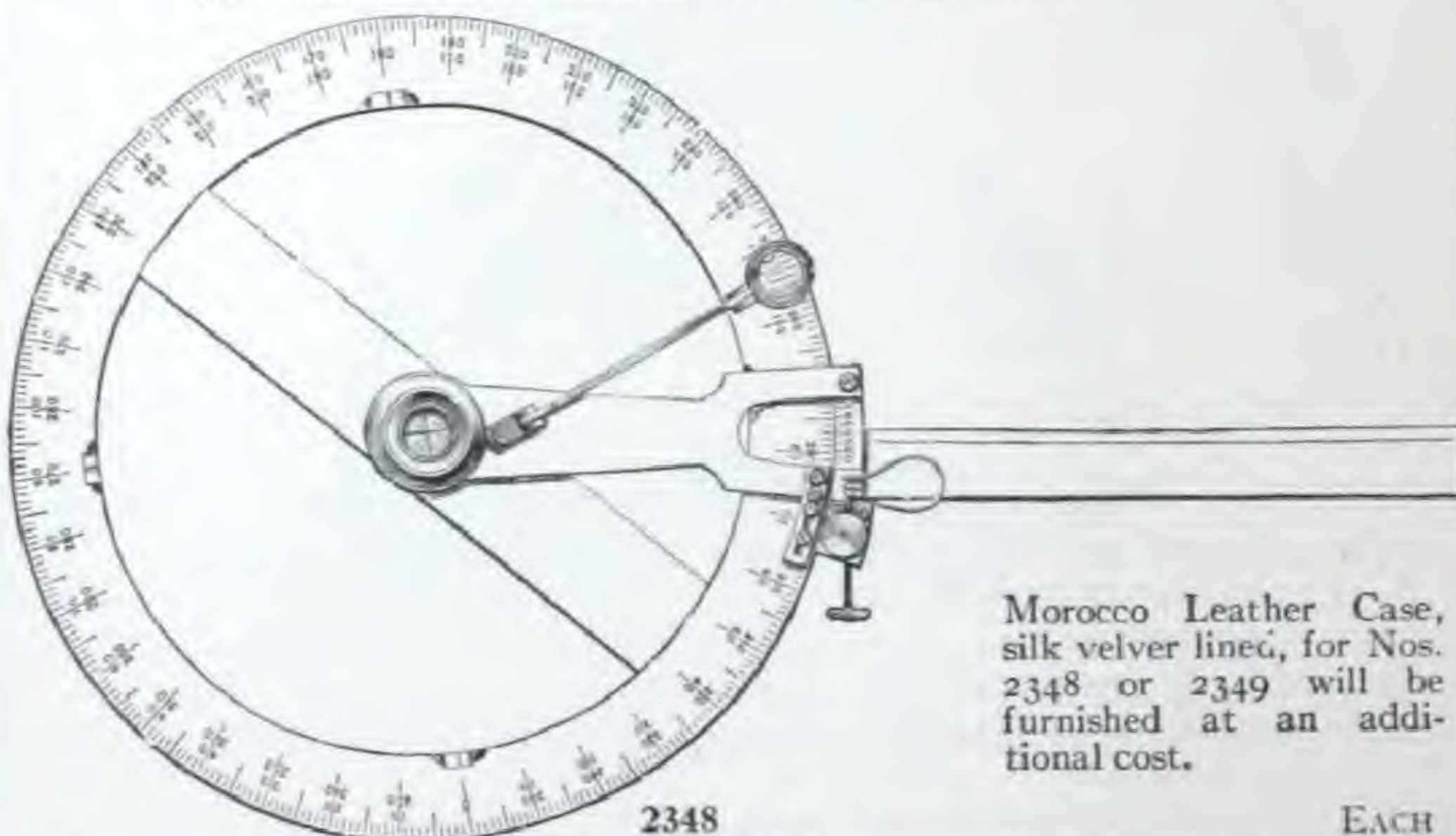
Circular with Vernier  
and Horn Center

Length of Arm beyond  
outer edge of Protractors,  
No. 2345,  $5\frac{1}{2}$  in., No.  
2346, 6 in., No. 2347,  $6\frac{1}{2}$   
in.

Morocco Leather Case,  
silk velvet lined, for Nos.  
2345, 2346, or 2347 will  
be furnished at an addi-  
tional cost.

EACH

- 2345 Circular, German silver,  $5\frac{1}{2}$  inches,  $\frac{1}{2}$  degrees, vernier reading to three minutes.....
- 2346 Circular, German silver, 8 inches,  $\frac{1}{2}$  degrees, vernier reading to one minute.....
- 2347 Circular, German silver, 10 inches,  $\frac{1}{2}$  degrees, vernier reading to one minute.....



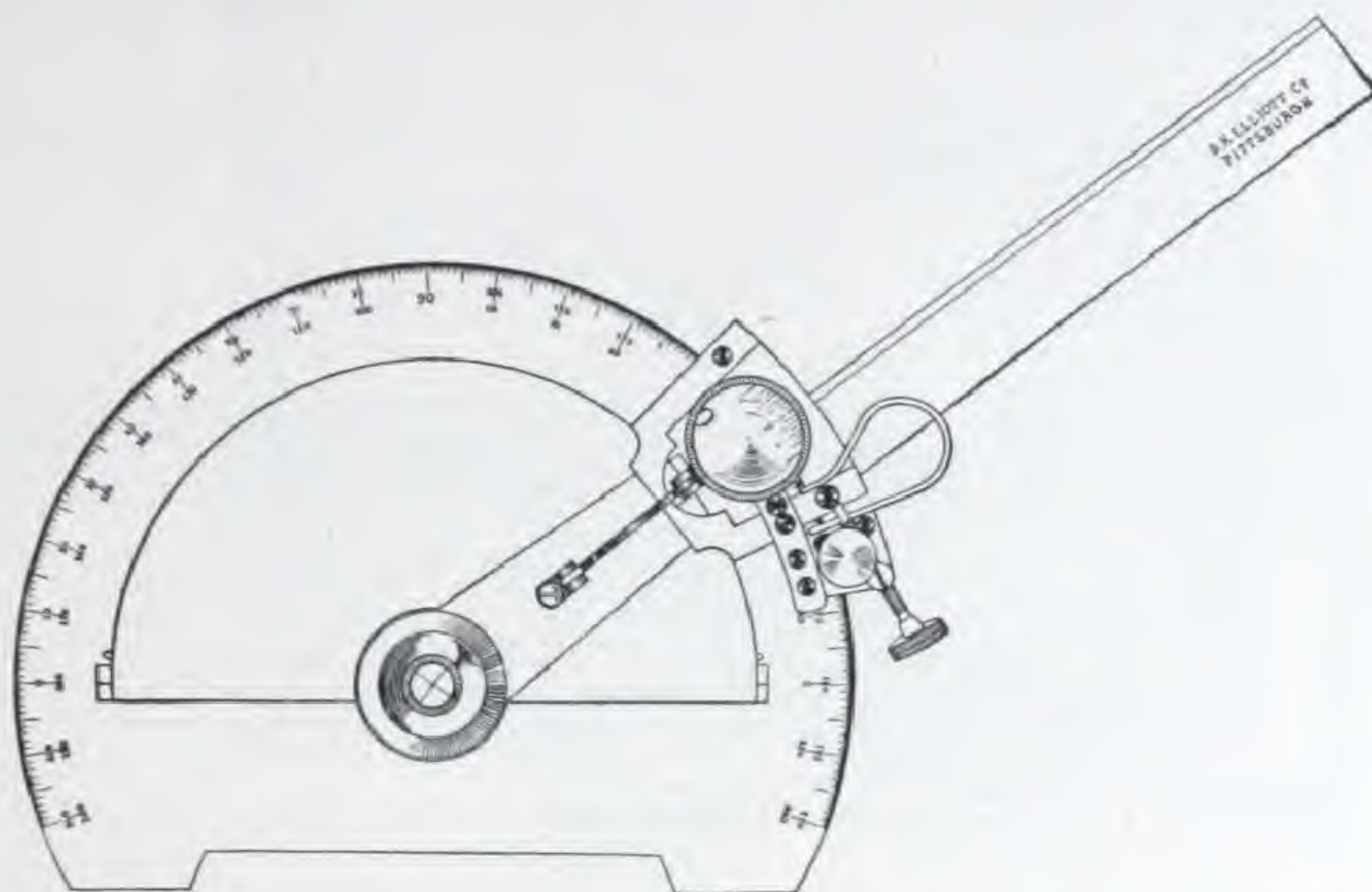
Morocco Leather Case,  
silk velvet lined, for Nos.  
2348 or 2349 will be  
furnished at an addi-  
tional cost.

EACH

- 2348 Circular, German silver, 8 inches,  $\frac{1}{4}$  degrees, vernier reading to one minute, with clamp screw, micrometer adjusting screw to vernier, and magnifying lens.....
- 2349 Circular, German silver, 10 inches,  $\frac{1}{4}$  degrees, vernier reading to one minute, with clamp screw, micrometer adjusting screw to vernier, and magnifying lens.....



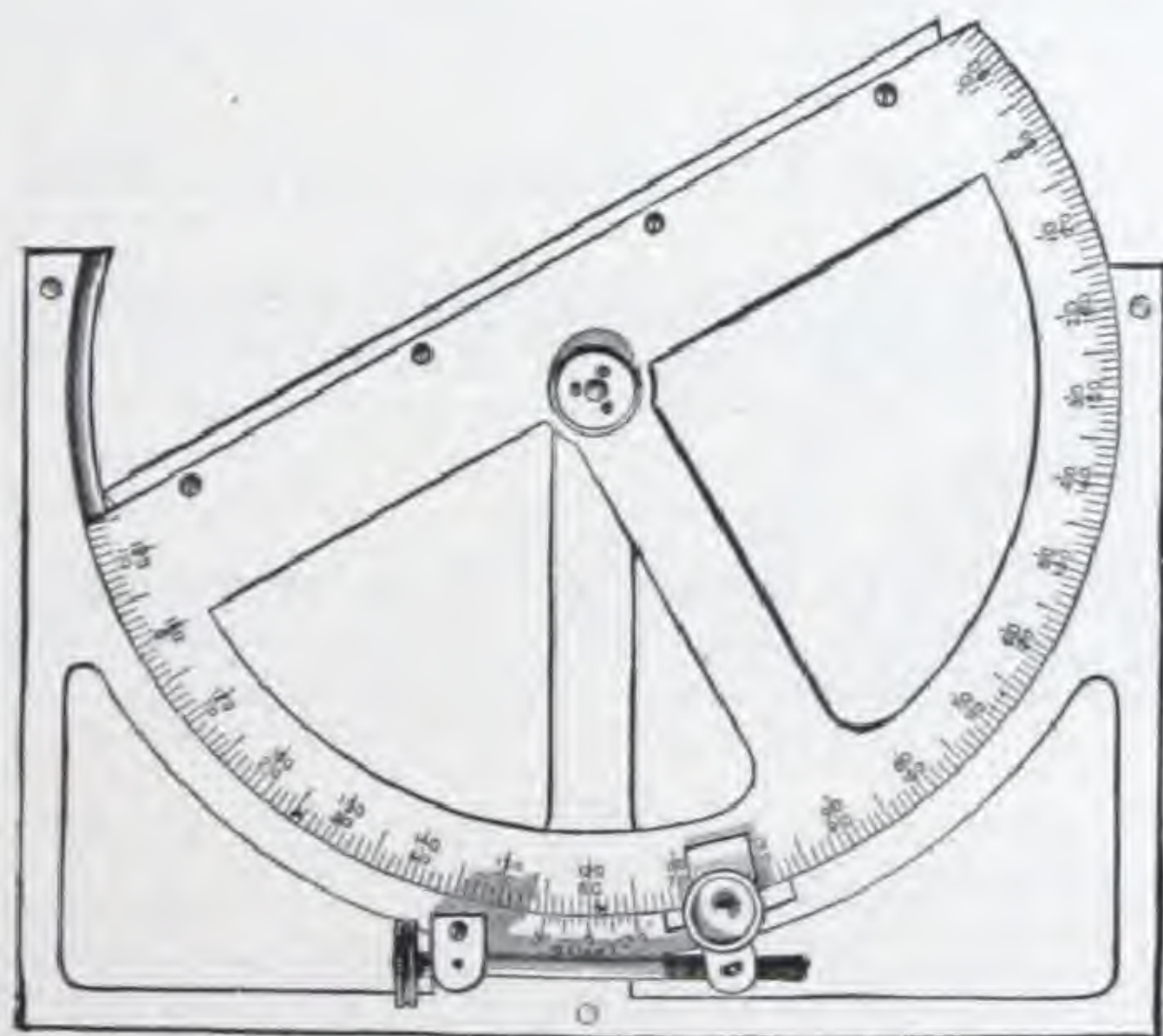
## METAL PROTRACTORS



2353

2353 Semicircular, German Silver, 8 inches,  $\frac{1}{4}$  degrees, vernier reading to one minute, with clamp screw, micrometer adjusting screw to vernier, and magnifying lens.....

EACH



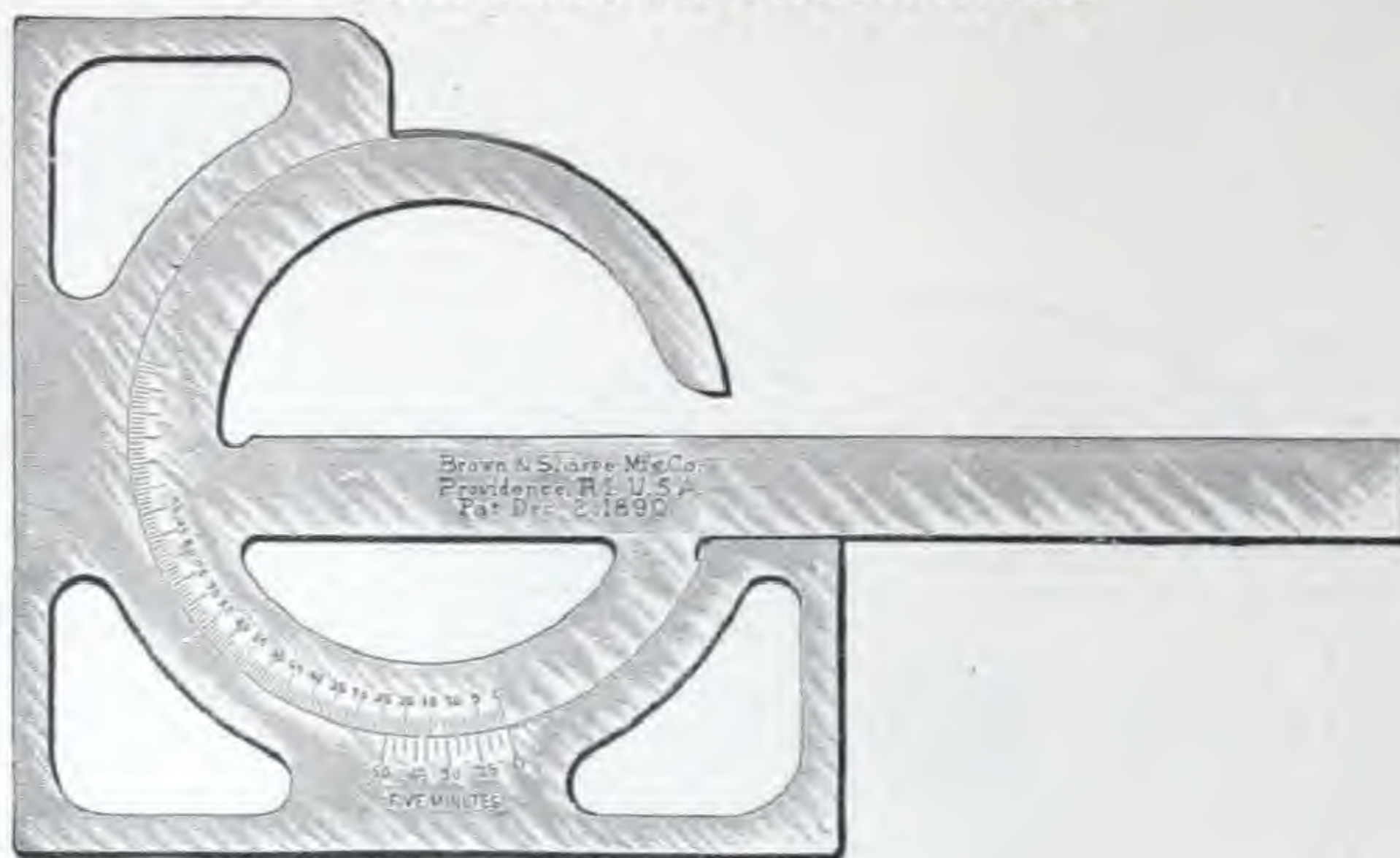
2352

2352 Crozet Protractor, German Silver, 8 inches, graduated to  $\frac{1}{2}$  degrees, folded vernier reading to minutes, with clamp and tangent screws, in polished wooden case.....

EACH



## DRAFTSMAN'S PROTRACTOR



2356

EACH

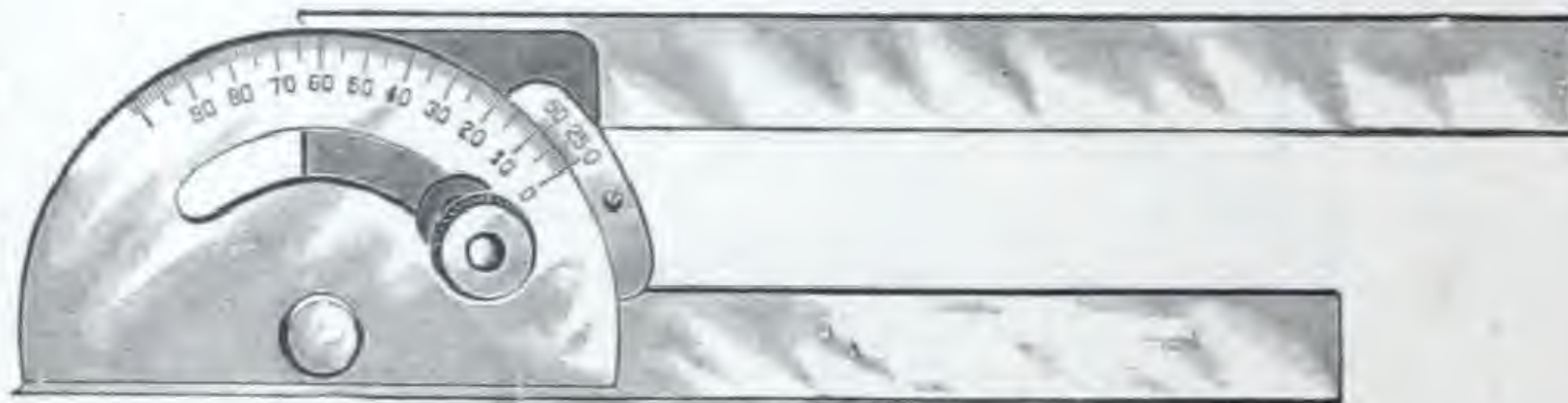
**2356** Draftman's Steel Protractor, with directions.....

**2357** Draftman's Steel Protractor, in morocco case.....

This Protractor is made from sheet steel and has a blade  $8\frac{1}{2}$  inches long. The graduations read to degrees and the vernier reads to five minutes.

There are no projections on either face of the Protractor, and consequently it can be used on either edge of the blade or either side up. This makes it particularly convenient in dividing circles, transferring angles, drawing oblique lines at right angles to each other, or laying off given angles each side of a vertical or horizontal line without changing the setting.

## DRAFTSMAN'S STEEL PROTRACTOR



2358

EACH

**2358** Draftman's Steel Protractor.....

**2359** Draftman's Steel Protractor, in mahogany case.....

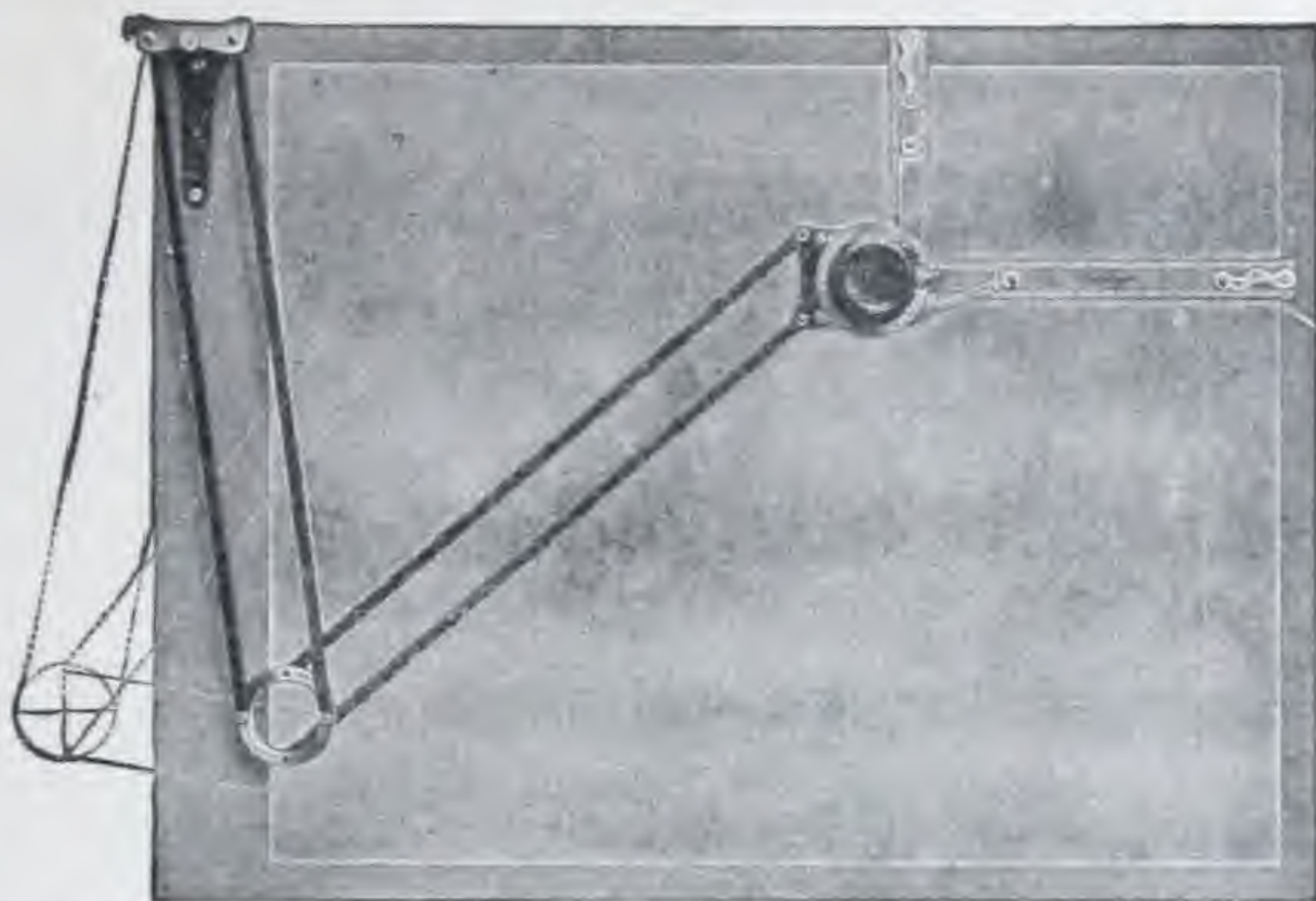
This Protractor has spring-tempered blades about 9 inches long. The arc is four inches in diameter, graduated to degrees, with a vernier reading to five minutes. It has a clamping screw that securely holds the blades at any angle and also serves as a knob.

Either blade can be used in contact with a T square, giving any angle and its complement from  $0^\circ$  to  $90^\circ$ .

It forms a perfect adjustable triangle, and is nicely finished. It is a convenient and reliable tool.



## THE UNIVERSAL DRAFTING MACHINE



The Universal Drafting Machine consists of two parallelograms, a protractor and a square having graduated ruling edges.

The two parallelograms joined together constitute an arm which, anchored to the board, gives the protractor and square a parallel motion about the drawing. This form of parallel motion permits either zero on the ruling edges to be instantly placed at any point on the drawing, by a single direct movement, due to the fact that the arm is similar to the human arm, and the action is just as free and direct as when you move your hand to any position.

Starting from zero, a line is drawn along the graduated ruling edge, just the exact length required. There is no attention of any kind given to alignment—there is no changing from a ruling edge to a scaling edge—there is no over-running end to be erased and patched up.

You simply move the zero to position by a single direct movement with one hand, and with the other, draw the line its exact length. The square is used for the reason that as soon as a line is drawn, another line at right angles to it is usually required. Considerable time and attention is thus saved, particularly in angular work. The scales of the square are interchangeable for all graduations.

A most conveniently arranged protractor permits the square to be set at any angle, and it then has the same parallel motion about the board as when set at zero. This universal feature saves so much time and bother that the Universal Drafting Machine as a whole will always show a higher percentage of saving, the greater the amount of angular work. No matter what the angle may be, you simply set the protractor, move the zero on the scale to position, and draw the line its exact length.

On the Standard Protractors positive automatic stops make it unnecessary to read or clamp the protractor at the most frequently used angles—a still further saving.

The protractor is the controlling centre of the Drafting Machine. It is held in the left hand, and from this position, all of the motions of the machine are readily controlled. The right hand is free for drawing lines.

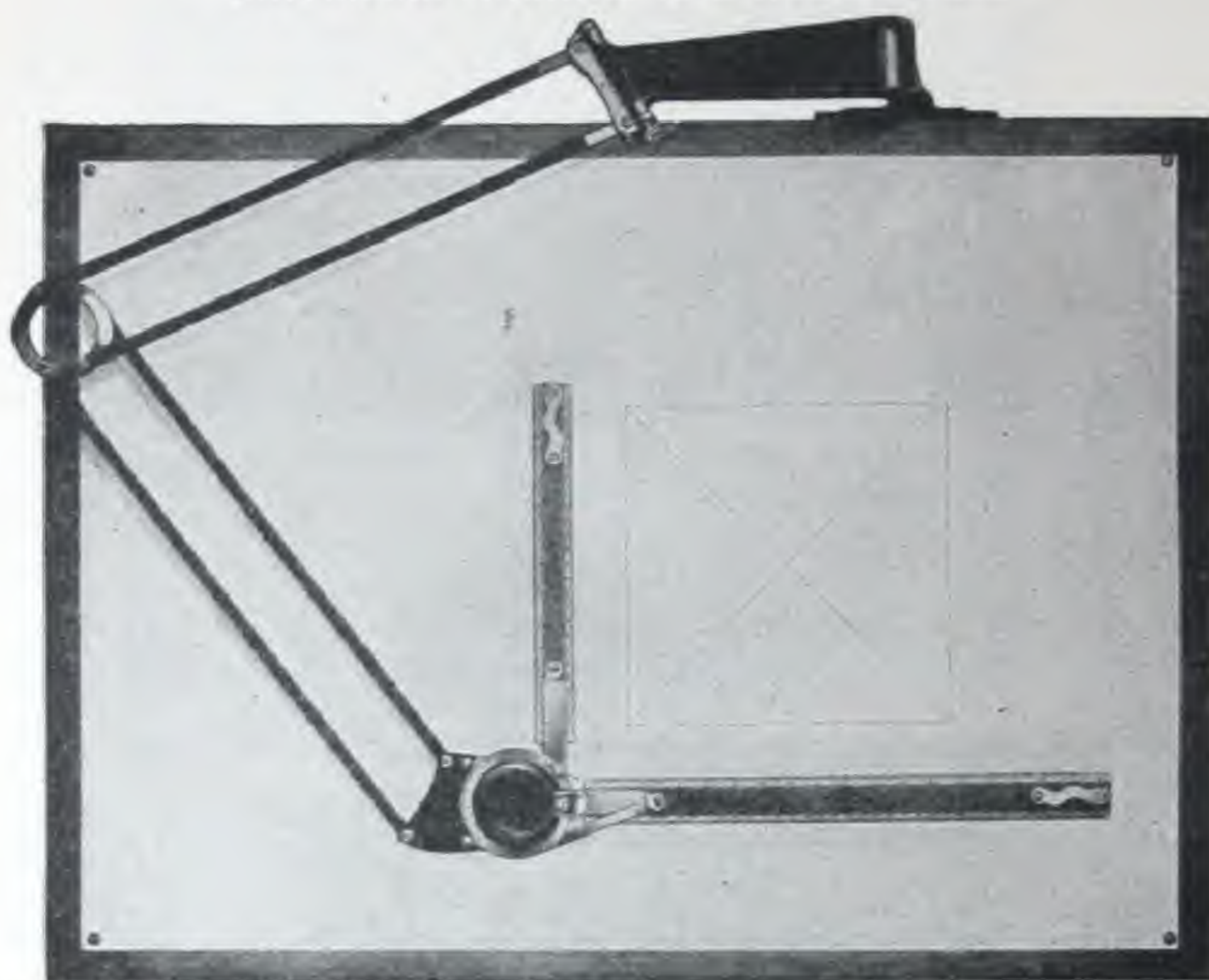
As the draftsman becomes accustomed to the absolute simplicity of placing the zero on the scale in position by a single direct movement of the left hand and drawing the line just its exact length with the right hand, he steadily gains in concentration and speed, and the result is a degree of efficiency never before attained.

Universal Drafting Machines are made for use on all kinds of drafting, on all kinds of boards, under all kinds of conditions. See description of types on page 112.

A special catalogue on these machines mailed upon request.



## UNIVERSAL MACHINE AND ACCESSORIES



Machine with Hardened Joints, Solid Rods and Mid Anchor

- |       |  |      |
|-------|--|------|
|       |  | EACH |
| 2360  | Mid Anchor type, for drawings 24 X 36, 30 X 42 and 36 X 50 in., Hardened Joint, Solid Rods, with Standard Protractor; without Scales or Straight Edges.    |      |
| 2360A | Mid Anchor type, for drawings 24 X 36, 30 X 42 and 36 X 50 in., Ball Bearing Tubular Rods, with Standard Protractor; without Scales or Straight Edges.     |      |
| 2360B | Corner Anchor type, for drawings 18 X 24, 24 X 36 and 30 X 42 in., Hardened Joint, Solid Rods, with Standard Protractor; without Scales or Straight Edges. |      |
| 2360C | Corner Anchor type, for drawings 18 X 24, 24 X 36 and 30 X 42 in., Ball Bearing Tubular Rods, with Standard Protractor; without Scales or Straight Edges.  |      |

## SCALES AND STRAIGHT EDGES

- |       |  |      |
|-------|--|------|
|       |  | EACH |
| 2360D | Flat White Edge Boxwood Scales, 6 in. (see graduations below).....   |      |
| 2360E | Flat White Edge Boxwood Scales, 12 in. (see graduations below).....  |      |
| 2360F | Flat White Edge Boxwood Scales, 18 in. (see graduations below).....  |      |
| 2360G | Flat White Edge Boxwood Scales, 24 in. (see graduations below).....  |      |
|       | No. 1. $\frac{3}{8}$ , $\frac{1}{4}$ , $1\frac{1}{4}$ and 3 in. to the foot. 8. $\frac{3}{8}$ X $\frac{3}{4}$ in. to the foot. |      |
|       | 2. $\frac{1}{2}$ , $\frac{3}{4}$ , $\frac{1}{2}$ and 1 in. to the foot. 9. $\frac{1}{2}$ X 1 in. to the foot.                  |      |
|       | 3. Full and half size. 10. $\frac{3}{4}$ X $\frac{1}{2}$ in. to the foot.  |      |

When ordering, specify catalog number of Scale and mention Scale Graduation desired—Nos. 1, 2, 3, 8, 9 or 10.

- |       |  |      |
|-------|--|------|
|       |  | EACH |
| 2360H | Straight Edges, Ebony or Maple lined, 12 in..... |      |
| 2360I | Straight Edges, Ebony or Maple lined, 18 in..... |      |
| 2360J | Straight Edges, Ebony or Maple lined, 24 in..... |      |
| 2360K | Straight Edges, Ebony or Maple lined, 36 in..... |      |

When ordering, specify catalog number of Straight Edge and mention lining desired—Ebony or Maple.

- |       |   |          |
|-------|---|----------|
|       |   | EACH     |
| 2360L | Straight Edges, Transparent Amber lined, 12 in..... |          |
| 2360M | Straight Edges, Transparent Amber lined, 18 in..... |          |
| 2360N | Straight Edges, Transparent Amber lined, 24 in..... |          |
| 2360O | Straight Edges, Transparent Amber lined, 36 in..... |          |
| 2360P | Center Pull Thumb Tacks.....                        | PER DOZ. |

A special catalog of these machines mailed upon request

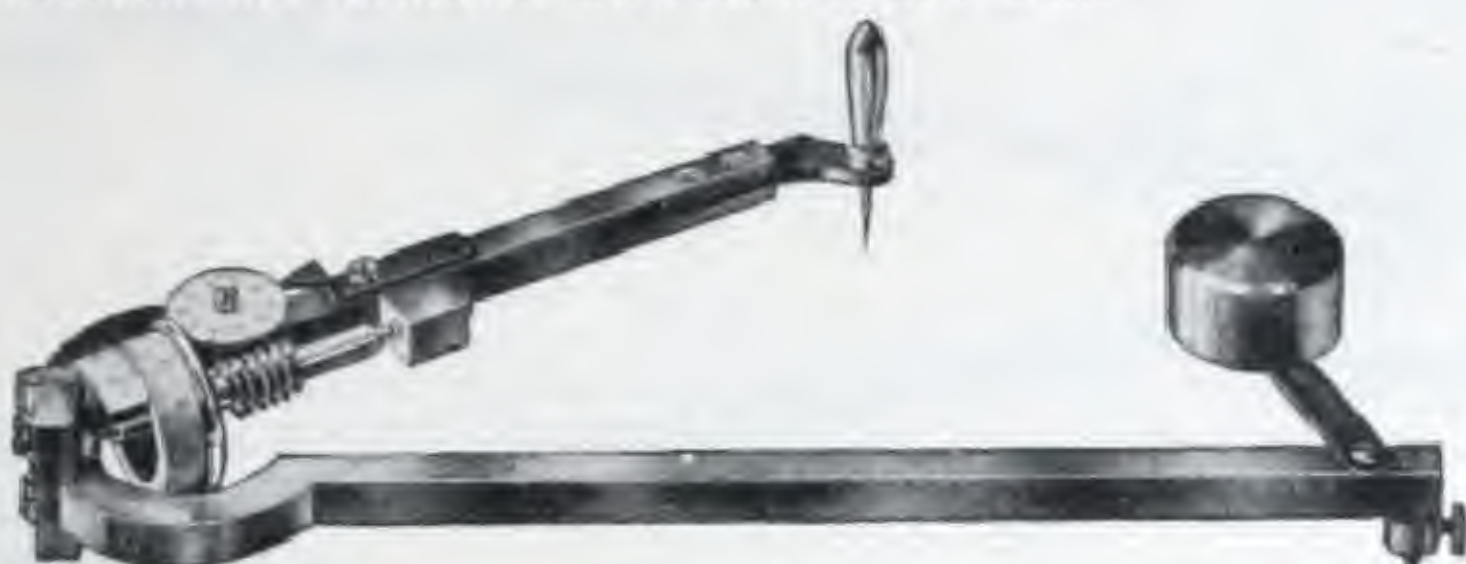


## PLANIMETERS

The Polar Planimeter is the simplest and most convenient instrument for measuring the area of surfaces on drawings and plans. It is of greatest importance to engineers and others, as plots of ground, area of railroad profile, indicator diagrams, sectional areas of vessels, areas of displacement of floating bodies, etc., can be ascertained very quickly.

The Rolling Planimeter differs from the Polar Planimeter, in that it moves on two broad rollers, and not being limited in scope like the Polar Planimeter, a surface of any size can be measured in one operation.

Full directions are furnished with each instrument.



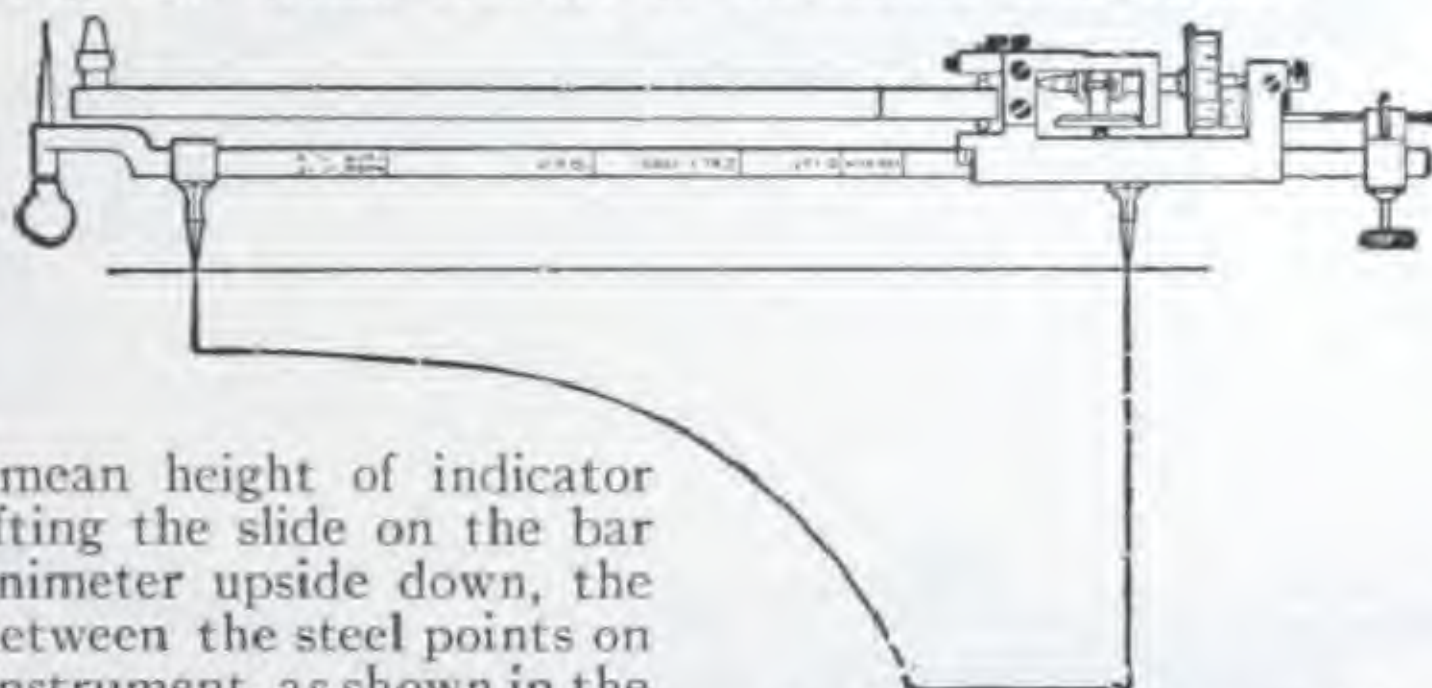
2361

EACH

**2361** Polar Planimeter, brass, with fixed tracer arm, counterweight for needle pole, and with horizontal disc, registering the revolutions of the measuring roller; for measuring areas up to 100 square inches.

### Device for Finding the Mean Height of Indicator Diagrams

This device consists of two fine steel points, one attached to the upper side of the tracer arm and the other to the surface of the carriage in which this arm slides. To find the mean height of indicator diagram, take, by shifting the slide on the bar and keeping the planimeter upside down, the diagram lengthwise between the steel points on the upper side of the instrument, as shown in the adjoining figure. Then place the planimeter without altering the relative position of slide and bar in the usual way upon the drawing—needle point outside the diagram—and follow the outline of the diagram with the tracing point. The difference of the readings at the beginning and at the end of the operation, divided by 0.4 is then the mean height of the diagram, expressed in inches.



Example:

Second reading.....2.361

First reading.....1.913

(0.4) 0.488 equals 1.12 inches, equals mean height.

If the diagrams for up and down stroke are measured jointly, divide by 0.8 instead of 0.4.

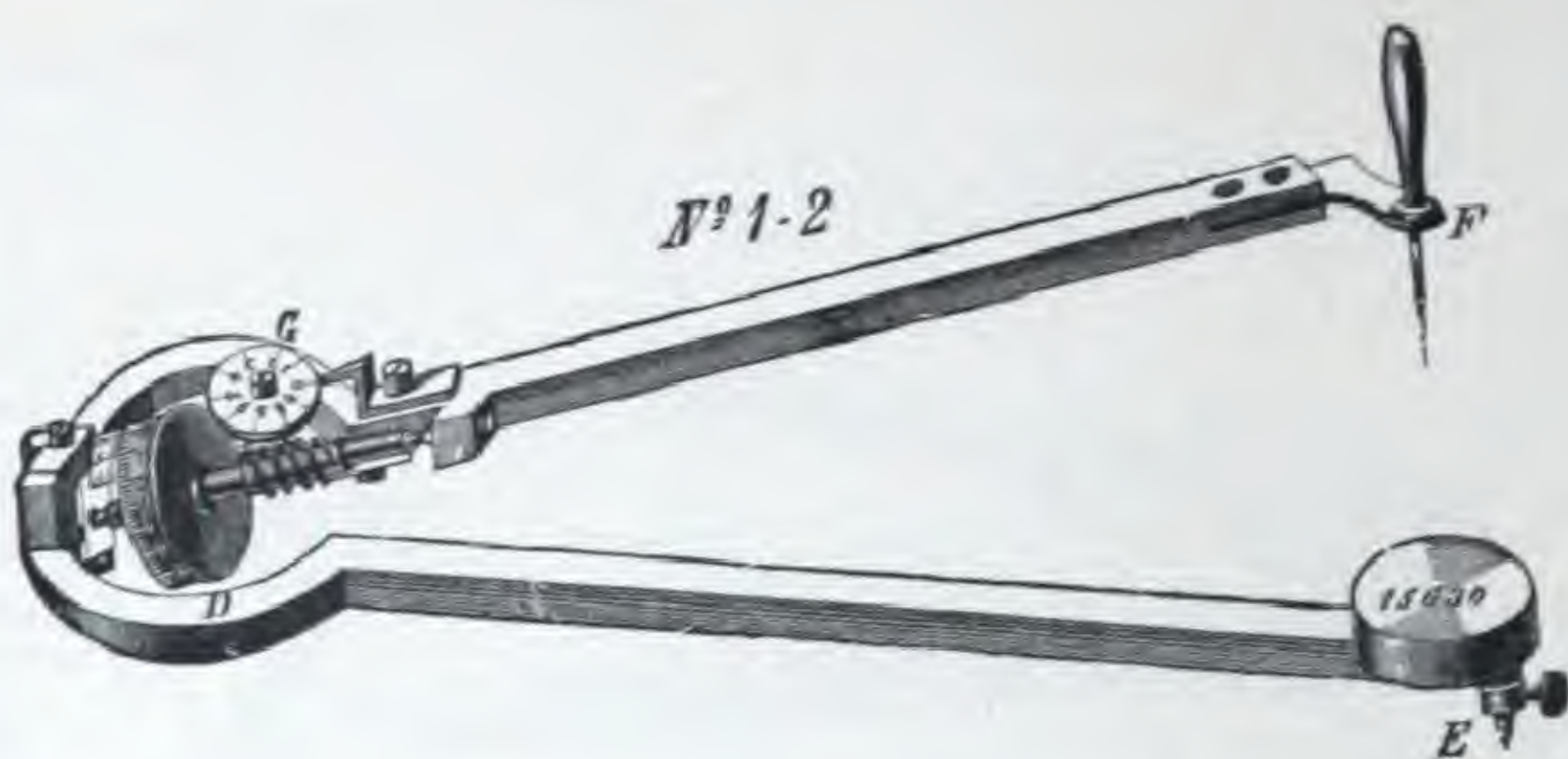
Mean pressure equals mean height multiplied by scale of spring of indicator. Supposing the scale of the spring in the above example is "I" equals 80 pounds per square inch, then

$$\text{Mean pressure} = \frac{0.448 \times 80}{0.4} = 89.6 \text{ pounds per square inch.}$$

The number of pounds per inch of height being usually a multiple of 4, the arithmetical work is thus extremely simple.

For instrument having this device, see No. 2364.

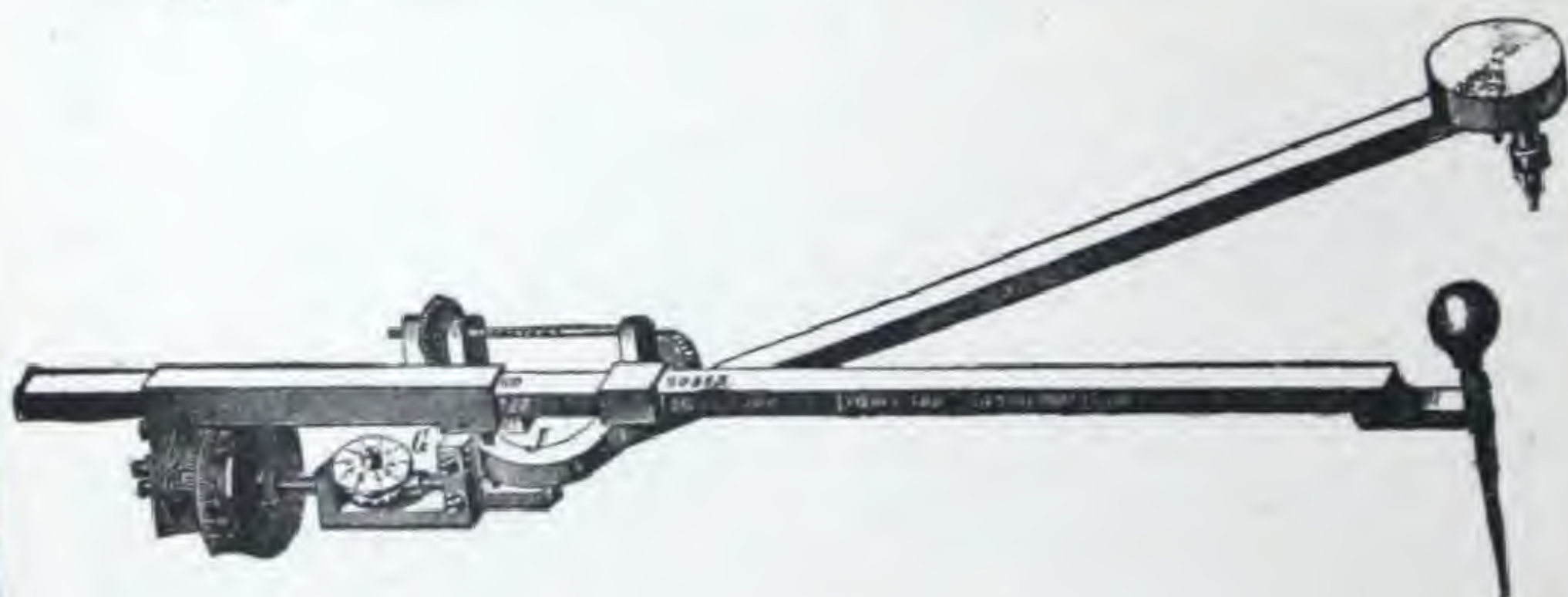




2362

EACH

2362 Amsler's Polar Planimeter, German silver, arranged for measurement of areas in square inches; viz., 10, 1, 1-10 and 1-100 square inches, with directions, in case.....



2363

EACH

2363 Amsler's Polar Planimeter, German silver, for every kind of measurement, with directions, in case.....



## PLANIMETERS—Continued.



2364

EACH

- 2364 Amsler's Polar Planimeter, German silver, arranged for every kind of measurement, with special arrangement for finding rapidly the mean height of indicator diagrams. In morocco case, with directions.....



2365

EACH

- 2365 Compensating Planimeter, German silver and brass; adjustable tracer arm, fully graduated, improved pole weight; testing rule and table of settings for U. S. standard measure, with directions, in case.....
- 2366 Compensating Planimeter, like No. 2365, but with adjustable pole arm, with directions, in case.....

Planimeters Nos. 2365, 2366 are constructed in a novel manner. Instrument No. 2365 consists of two separate parts: the tracer arm and the carriage with measuring and recording wheels, and the pole arm having the pole weight at one end and a steel ball at the other end, which forms a ball joint with the wheel carriage. This construction gives the tracer arm a motion of 180 degrees right and left, whereas with the usual Planimeters a motion of only about 90 degrees can be obtained. By measuring a diagram with the pole on the left, and then again with the pole on the right side of the tracer arm, and taking the mean reading, all instrumental errors are compensated.

Instrument No. 2366 has an adjustable pole arm bearing index marks for the different settings furnished with the instrument, and can be adjusted so that when the instrument is used with the pole inside of a figure, the constant is a round number 20,000, for any setting. It is used in the same way with the pole inside as with the pole outside, and by tracing the figure with the pole on the right and on the left of tracer arm and taking the mean reading, large areas can be accurately measured.

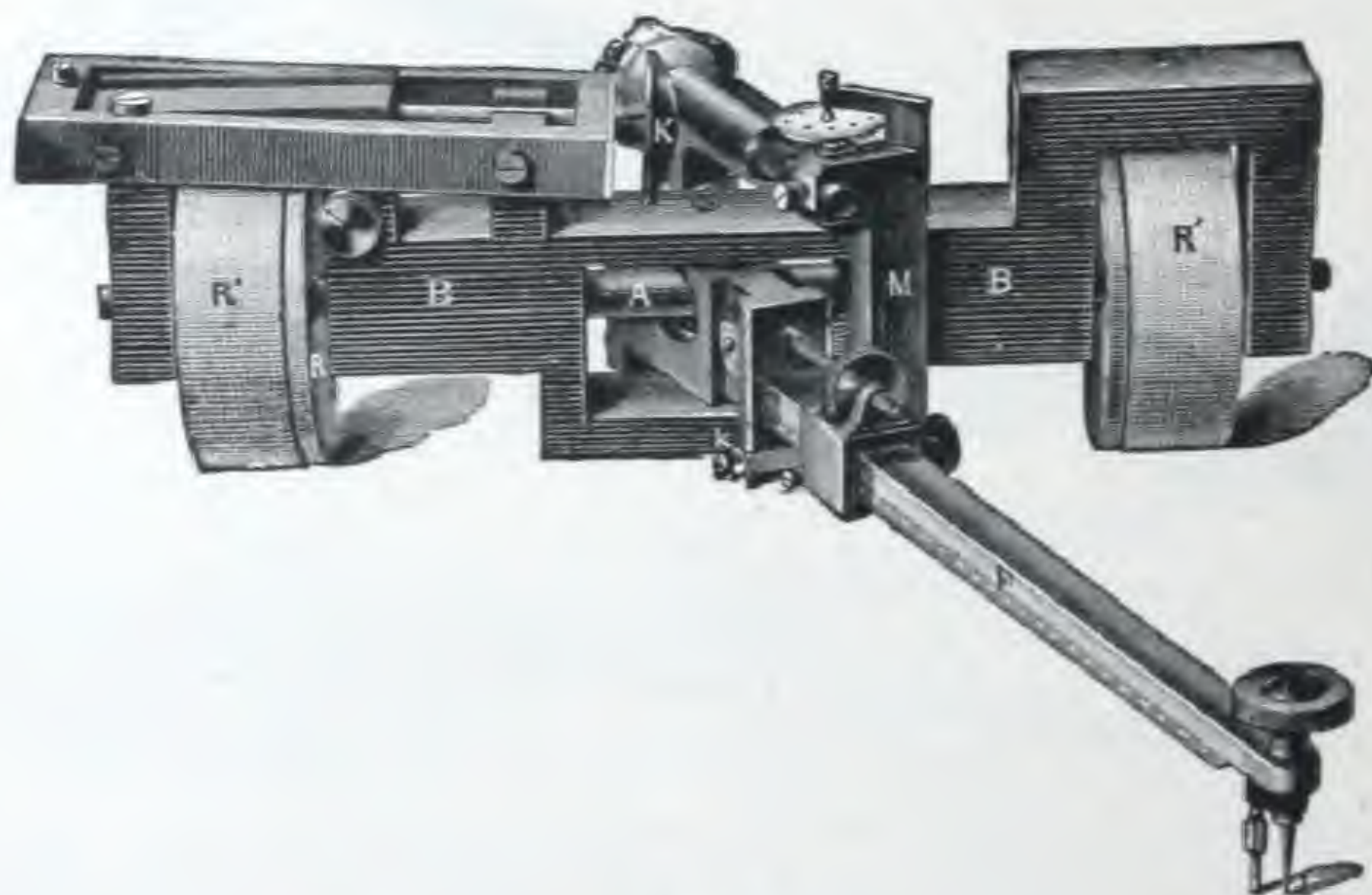


## PLANIMETERS—Continued.



2368

- 2368** Suspended Ball Planimeter, German silver and brass, tracer arm  $11\frac{1}{4}$  inches long, the pole arm  $6\frac{1}{4}$  inches long, and the diameter of the toothed circle on the pole is  $6\frac{1}{4}$  inches long. The angular motion of the tracer arm is about 90 degrees. Surfaces from  $2\frac{1}{2} \times 4$  inches to  $7 \times 10$  inches can be measured without moving the pole. Instrument complete, in morocco case, and complete book of instructions.

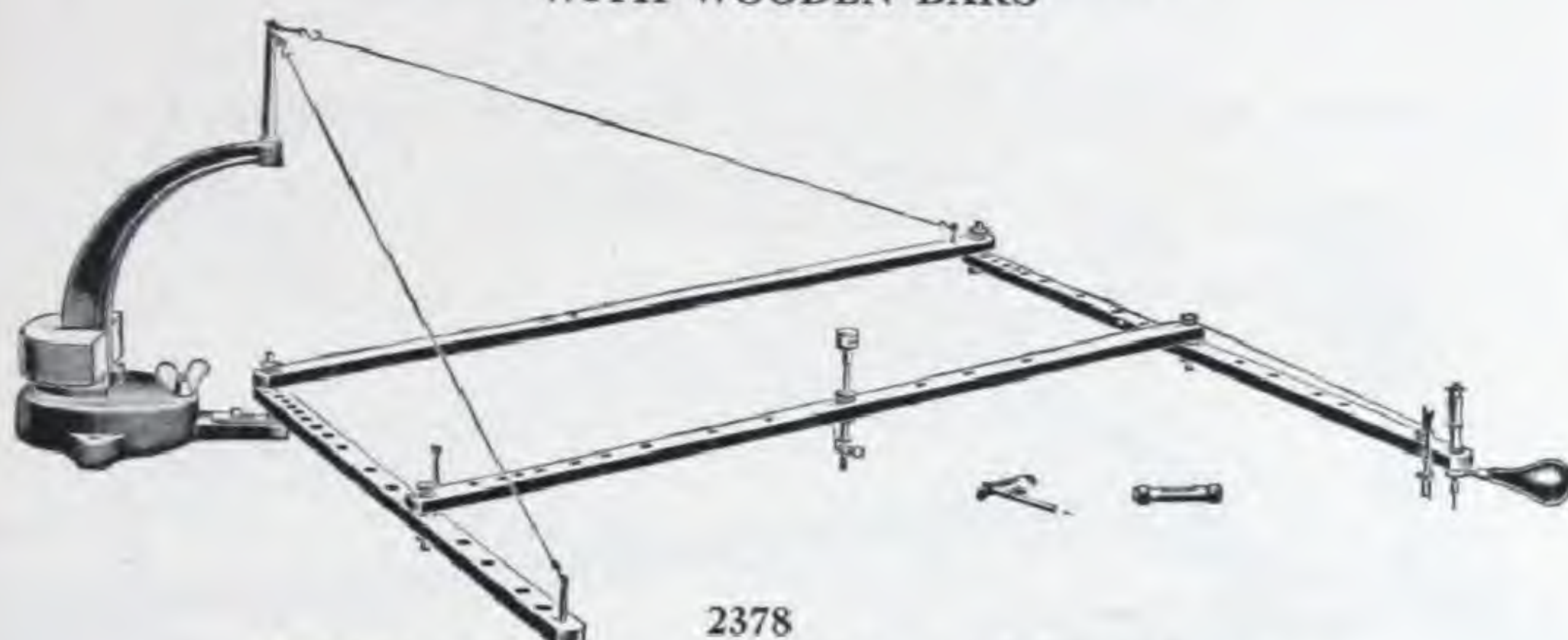


2369

- 2369** Rolling Ball Planimeter, German silver and brass, having tracer arm  $11\frac{3}{4}$  inches long, which can be increased by a lengthener to  $19\frac{3}{4}$  inches. Its angular motion is about 90 degrees. The two rollers are made of exactly equal diameters, ensuring the motion of the instrument, as a whole, in a straight line. A surface of any length and of a width of 20 inches can be measured with the  $19\frac{3}{4}$ -inch tracer arm. Instrument complete, in morocco case, and complete book of instructions.



### SUSPENDED PANTOGRAPHS WITH WOODEN BARS



2378

**For Reducing and Enlarging in the following ratios:**

5:4, 4:3, 3:2, 5:3, 2:1, 5:2, 3:1, 4:1, 5:1, 6:1, 8:1, 10:1, 12:1, 20:1, or vice versa.

Suspended Pantograph, made of well seasoned pearwood bars, connected by polished steel cone joints with holes accurately drilled for the above ratios. Solid iron standard, with weight. Tracing and pencil point are interchangeable. Instrument complete with adjustable tracing point, steel point, pencil point with three brass weights, spirit level and instructions for use. In wooden case with lock and key.

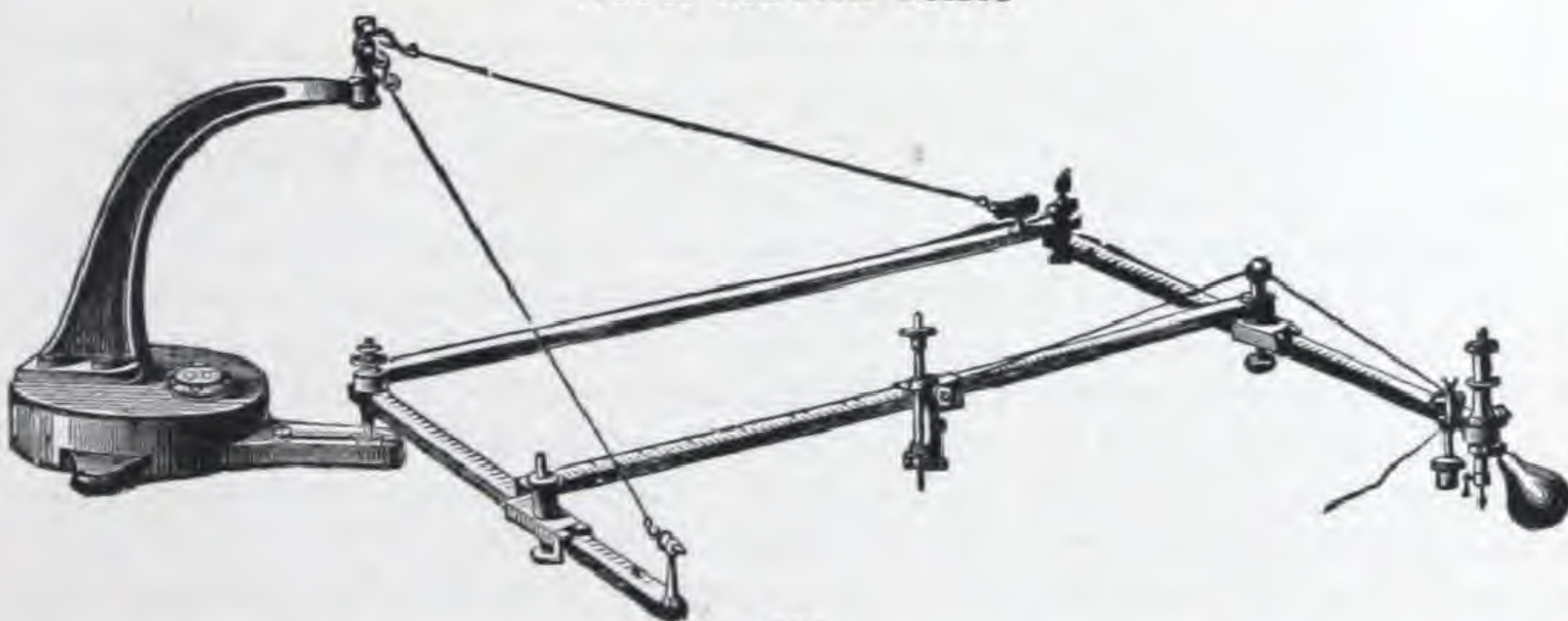
EACH

2378 Suspended Pantograph with wooden bars 28 inches long.....

2379 Suspended Pantograph with wooden bars 33 inches long.....

2380 Suspended Pantograph with wooden bars 38 inches long.....

### WITH METAL BARS



2381

**For Reducing from 20:1 to 5:4 or Enlarging from 1:20 to 4:5 in all ratios**

Suspended Pantograph, made of square, hollow metal bars, fully divided and connected by cone joints, insuring an accurate and easy movement. The edges of the tubular slides are beveled to facilitate the reading of ratios. Solid iron standard with one extra weight. Tracing and pencil point are interchangeable. Instrument complete with adjustable tracing point, two steel points, pencil point with three brass weights, spirit level and instructions for use. In wooden case with lock and key.

EACH

2381 Suspended Pantograph with metal bars 28 inches long.....

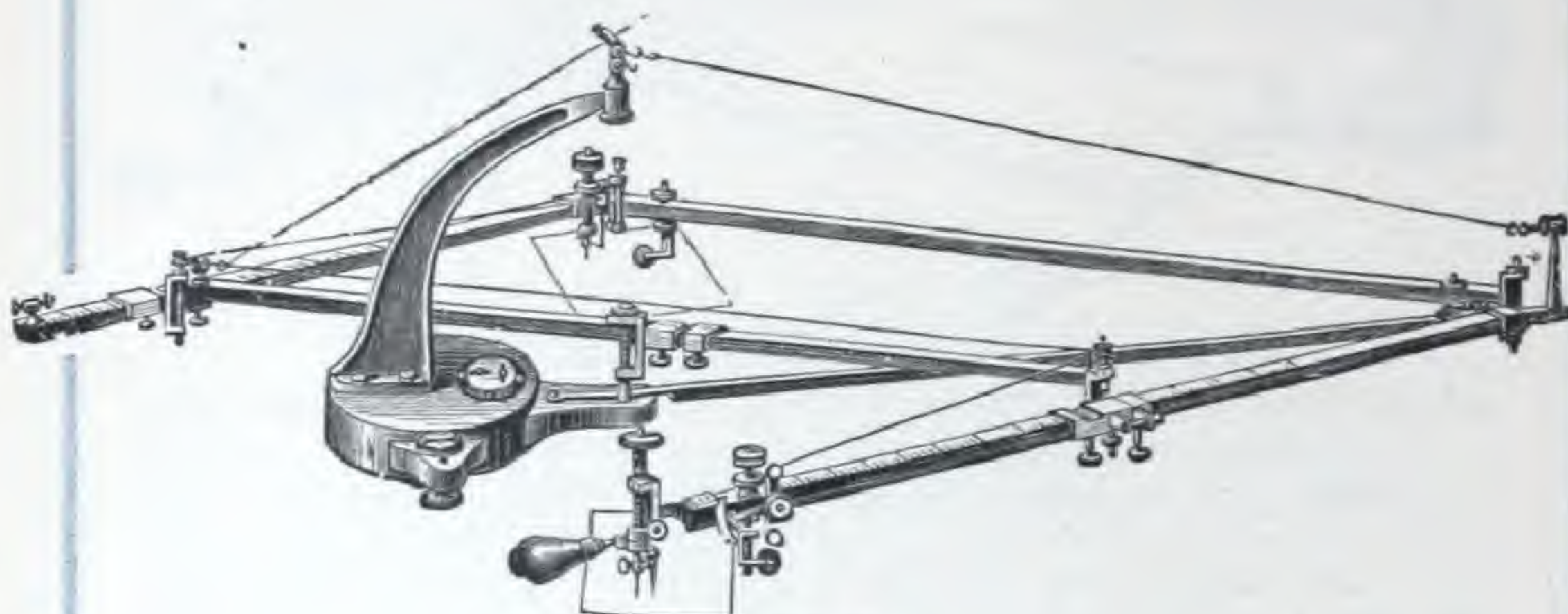
2382 Suspended Pantograph with metal bars 33 inches long.....

2383 Suspended Pantograph with metal bars 38 inches long.....



## SUSPENDED PANTOGRAPHS

Of Fine Mechanical Construction, Especially Adapted for Very Accurate Reproductions



2384B

For Reducing from 20:1 to 1:1, or Enlarging from 1:1 to 1:20 in all ratios, or Reproducing the Original Size

Pantograph, suspended, made of square, hollow, nickeled-brass tubes, divided in millimetres, with verniers on the beveled sides for setting the instrument to 1-10 millimetre scale, and micrometer movement for adjusting the proportions. For reducing and enlarging in all proportions from 1/20 to 4/5. It is also arranged that by exchanging pole and drawing pencil it can be used for 1/1 proportion or copying in the original size. The instrument is then held freely swinging by means of the diagonal supporting bar, and can then be used also on etching ground by removing the roller on the drawing point. The joints run on cone-shaped pivots to assure an accurate and easy movement. The standard is provided with two set screws and spirit level to adjust the instrument to a horizontal position, with convenient controlling arrangement. In polished wooden case, with lock and handle.

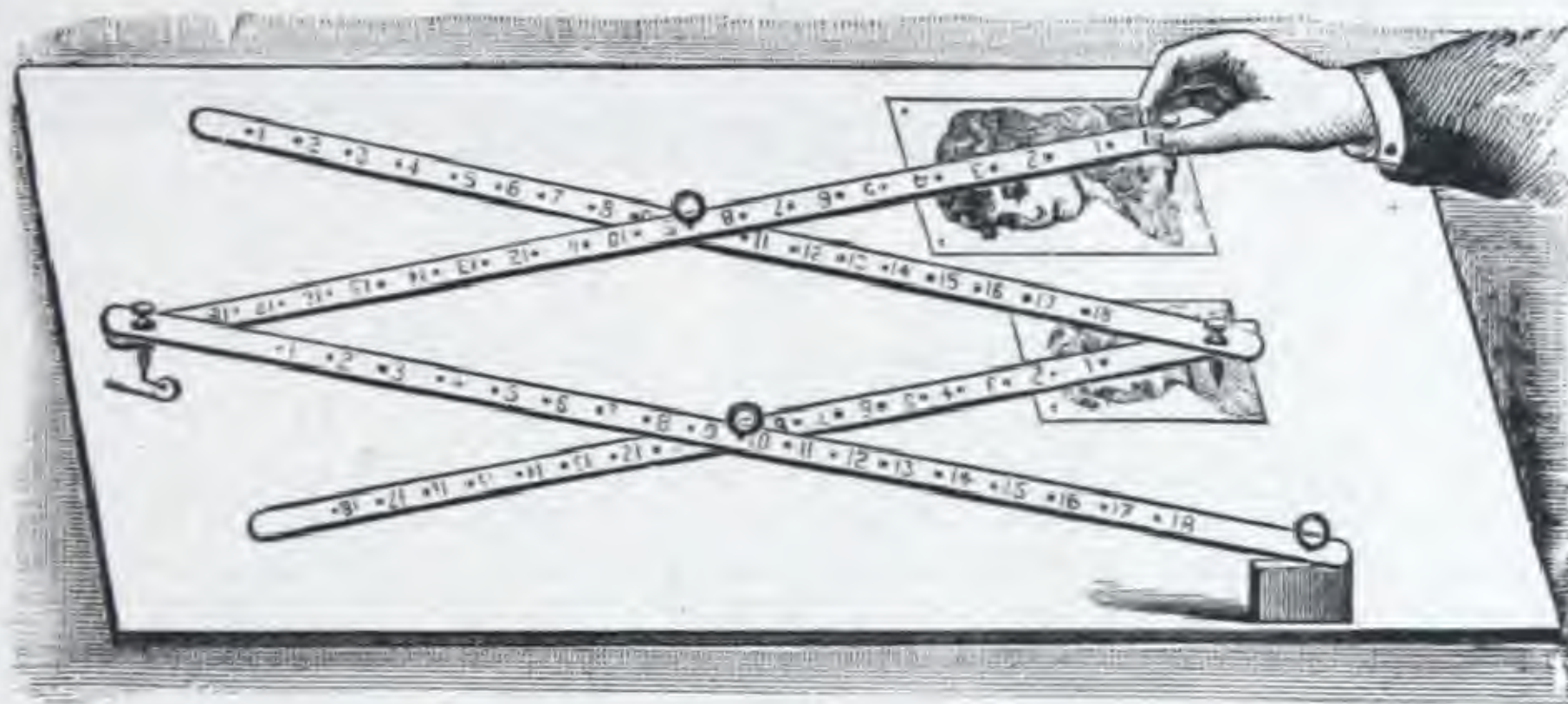
EACH

- 2384B Suspended Pantograph, with metal bars 28 inches long . . . . .
- 2384C Suspended Pantograph, with metal bars 33 inches long . . . . .
- 2384D Suspended Pantograph, with metal bars 38 inches long . . . . .
- 2384E Same as 2384B for reducing and enlarging in proportions 1/20 to 4/5, without the attachment for copying in the original size; arm 33 inches long . . . . .
- 2384F Extra Glass Pointer with lenses for accurate adjustment, which can only be used with instruments with arms 33 and 38 inches long . . . . .



## PANTOGRAPHS—Continued.

## For Enlarging and Reducing Drawings



2377

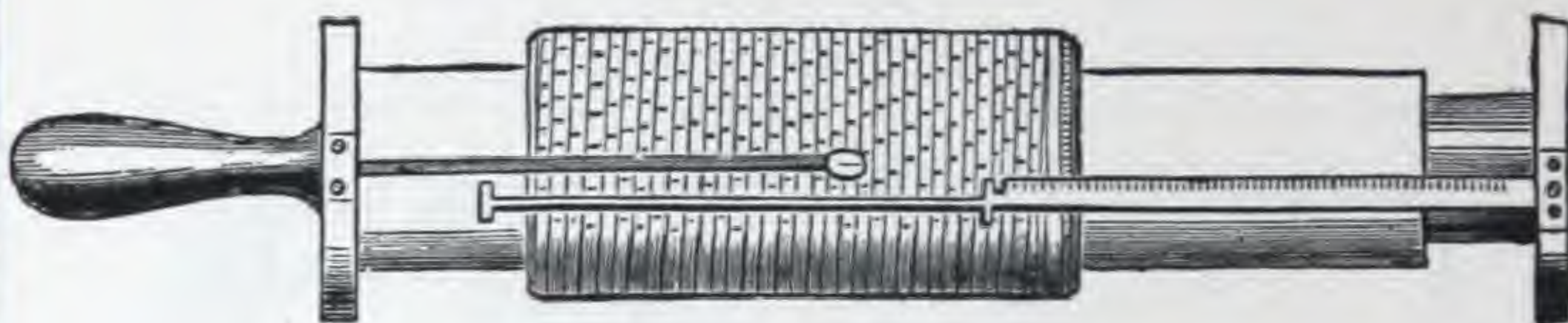
EACH

- 2377** Pantograph of polished wooden bars, 41 inches long, fancy lined, with joints formed by bolts and thumb nuts, metal foot. For reducing and enlarging drawings in 34 ratios, from 8:1 to  $1\frac{1}{8}$ :1 or vice versa. In plain wooden box. ....
- 2377A** Heavily mounted, with nickel-plated elbow joint wheel, pencil holder and exchangeable point; finely polished, black figures, in neat box, 21 inches long. ....
- 2377B** Brass mounted, with brass elbow joint wheel, pencil holder and movable point; polished, black figures, in box. ....
- 2377C** Brass mounted, same as No. 2377B in every respect, except that it is not polished, in box. ....
- 2377D** Brass mounted, same as No. 2377C, except movable point instead of wheel. ....
- 2377E** A good Pantograph for the price. It has very neat and substantial trimmings, clean cut figures; a very neat and satisfactory instrument. ....
- 2377F** Is a smaller instrument. It is recommended by teachers as an excellent means of familiarizing children with form and proportion, and greatly assisting them in acquiring a knowledge of the rudiments of drawing by sight from original objects. ....

Complete directions furnished with each Pantograph.



## FULLER'S SLIDE RULE



2394

2394 Fuller's Spiral Slide Rule, in mahogany box, with directions, each

Fuller's Spiral Slide Rule consists of a hollow cylinder tube which can be moved up or down or around an inner cylinder provided with a handle. A single logarithmic scale nearly 42 feet long is wound spirally around the outer cylinder. There are two indexes; a fixed one attached to the handle, and a movable one attached to a brass tube sliding in the inner cylinder. This latter bears two indexes (whose distance apart is the axial length of the complete spiral) and a scale of equal parts for the rapid finding of logarithms. On the inner cylinder is a number of valuable tables and settings.

Ratios are established by setting a given number to the fixed index, setting the movable index to another given number, bringing any other number to the fixed index and reading the fourth term at the movable index. Hence the Fuller Rule requires setting each time the third term of a proportion changes, and it does not give a complete series of equal ratios at sight.

## THE BOUCHER CALCULATOR



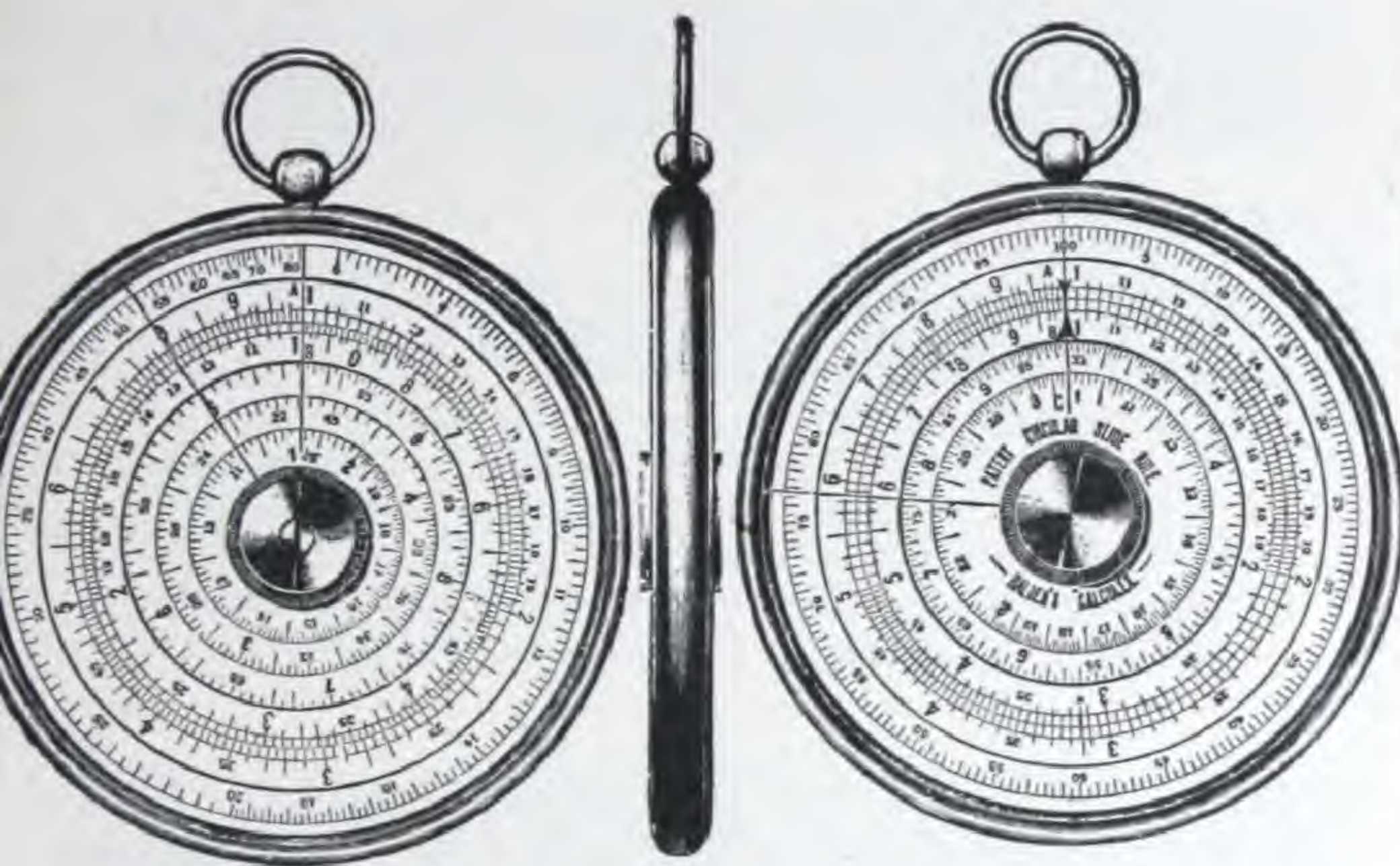
2391

This instrument is made similar to an ordinary stem-winding watch, with glass covered dials, front and back. Ratios are set off by means of pointers which, as well as the movable dial, are turned by means of the "stem-winder" key. The instrument is  $2\frac{1}{8}$  inches in diameter by  $\frac{9}{16}$  inch thick, and does not take up more room in the pocket than an ordinary watch.

2391 Boucher Calculator, enameled cardboard dials..... EACH  
 2392 Boucher Calculator, silvered metal dials.....



## THE IMPROVED HALDEN CALCULEX



Back Face

2395

Front Face

EACH

**2395** Improved Halden Calculex, watch pattern, diameter  $2\frac{3}{8}$  inches, in leather case, with book of rules.....

The Improved Halden Calculex is the most practical and durable circular slide rule manufactured. It consists of a metal disc, graduated and glass-covered on both sides. The central section of the disc and the glass covers (marked with hairlines) are revolvable.

There are eleven scales on the two faces of the instrument. The front face (see cut) has five circles of scales: The outer one, or No. 1, is a scale of logarithms; Nos. 2 and 3 are the calculating scales A and B; Nos. 4 and 5 are the square roots of scale B. The back face (see cut) shows six circles of scales: The outer one, or No. 6, is a scale of angles; Nos. 7 and 8 are calculating scales for inverse proportions; Nos. 9, 10 and 11 are cube roots of scale B.

The log. of a number, squares, square roots, cubes, cube roots, angles, etc., can be found by reading direct from the hairlines without moving the dial. By means of the reciprocal scale, such calculations as  $3.15 \times 5.85 \times 4.25$  may be solved in one setting.

As the graduated disc of the Calculex is made of metal, it can not warp or shrink; consequently, the scales will retain their accuracy. The simple construction makes the instrument easy to operate, and, as there are no knobs, keys or gears used, it can not get out of order.



## FABER'S SLIDE RULES



2396

EACH

- 2396 Faber's Slide Rule, 10 inches, mahogany, white celluloid surface, with decimals and glass indicator, in case.....
- 2397 Faber's Slide Rule, 10 inches, mahogany, white celluloid surface, with decimals. This Rule recently introduced for intermediate schools.  $1\frac{3}{8}$  inches in width and  $\frac{3}{8}$  inch in thickness, both edges beveled and ordinary indicator. This Rule does not have the set of scales on the reverse of the slide for solving trigonometrical problems and logarithms, in case.....



2398

EACH

- 2398 Faber's Slide Rule, 10 inches, mahogany, white celluloid surface, with decimals and self-adjusting slide, glass indicator.....

This Rule has a further improvement by the insertion into its body, lateral to the slide, of a mahogany adjuster, which acts upon the slide like a spring and insures to its movement an even and adequate friction, safeguarded against becoming either excessively tight or excessively loose under changes of temperature and atmospheric humidity.

- 2399 Faber's Slide Rule, same as No. 2398, but without lateral lines.....



2400

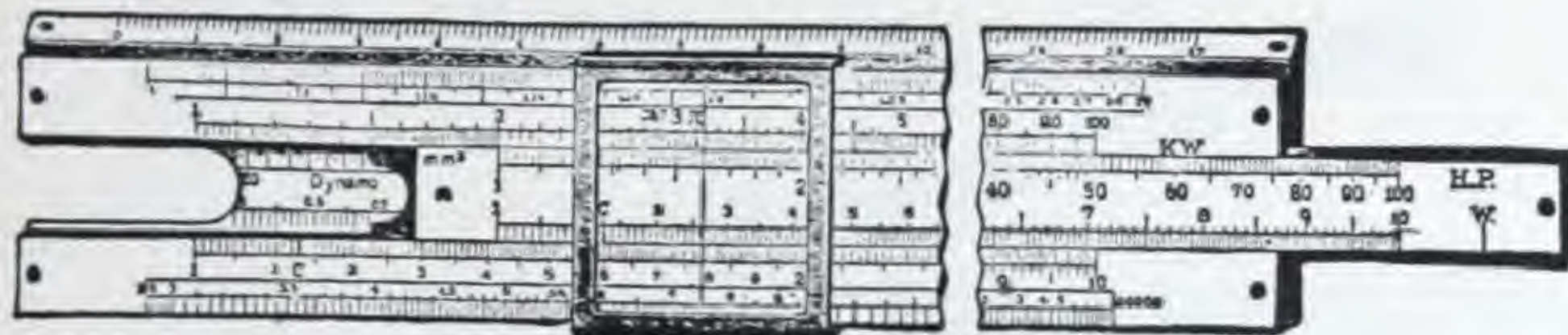
EACH

- 2400 Faber's Slide Rule, 10 inches, mahogany, white celluloid surface, without decimals, but with self-adjusting slide and digit indicator,
- 2401 Faber's Slide Rule, 5 inches, mahogany, white celluloid surface, with decimals and glass indicator, but without self-adjusting slide, No. 2401 makes a very convenient Rule for the pocket Book of Directions furnished with each Faber Rule



## FABER'S SLIDE RULES—Continued.

## THE LOG-LOG RULE



2402

ACH

- 2402 Faber's Slide Rule, 10 inches, mahogany, white celluloid surface, without decimals and with self-adjusting slide and special indicator, for electrical and mechanical engineers, with log-log scale.....



2403

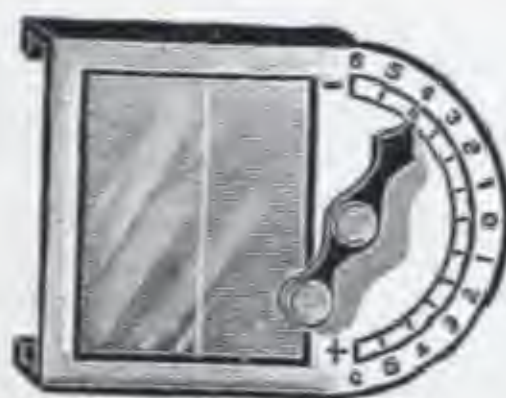
EACH

- 2403 Faber's Slide Rule, 20 inches, mahogany, white celluloid surface, without decimals, but with self-adjusting slide and glass indicator
- 2404 Faber's Demonstrating Slide Rule, 8½ feet long.....

## SUNDRIES FOR SLIDE RULES



2405A



2405B

EACH

- 2405A Glass Indicator, with one hairline (as furnished with Rules).....
- 2405B Glass Indicator, with decimal pointer, one hairline.....
- 2405C Sole Leather Case, for 10-inch Slide Rule.....



## PARALLEL RULES



## 2410A-2410F

Best Quality

EACH

- 2410A Ebony Parallel Rules, brass bars, 6 inches.....
- 2410B Ebony Parallel Rules, brass bars, 9 inches.....
- 2410C Ebony Parallel Rules, brass bars, 12 inches.....
- 2410D Ebony Parallel Rules, brass bars, 15 inches.....
- 2410E Ebony Parallel Rules, brass bars, 18 inches.....
- 2410F Ebony Parallel Rules, brass bars, 24 inches.....
- 2411A Rubber Parallel Rules, nickel-plated bars, 6 inches.....
- 2411B Rubber Parallel Rules, nickel-plated bars, 9 inches.....
- 2411C Rubber Parallel Rules, nickel-plated bars, 12 inches.....
- 2411D Rubber Parallel Rules, nickel-plated bars, 15 inches.....
- 2411E Rubber Parallel Rules, nickel-plated bars, 18 inches.....
- 2411F Rubber Parallel Rules, nickel-plated bars, 24 inches.....



## 2413-2422

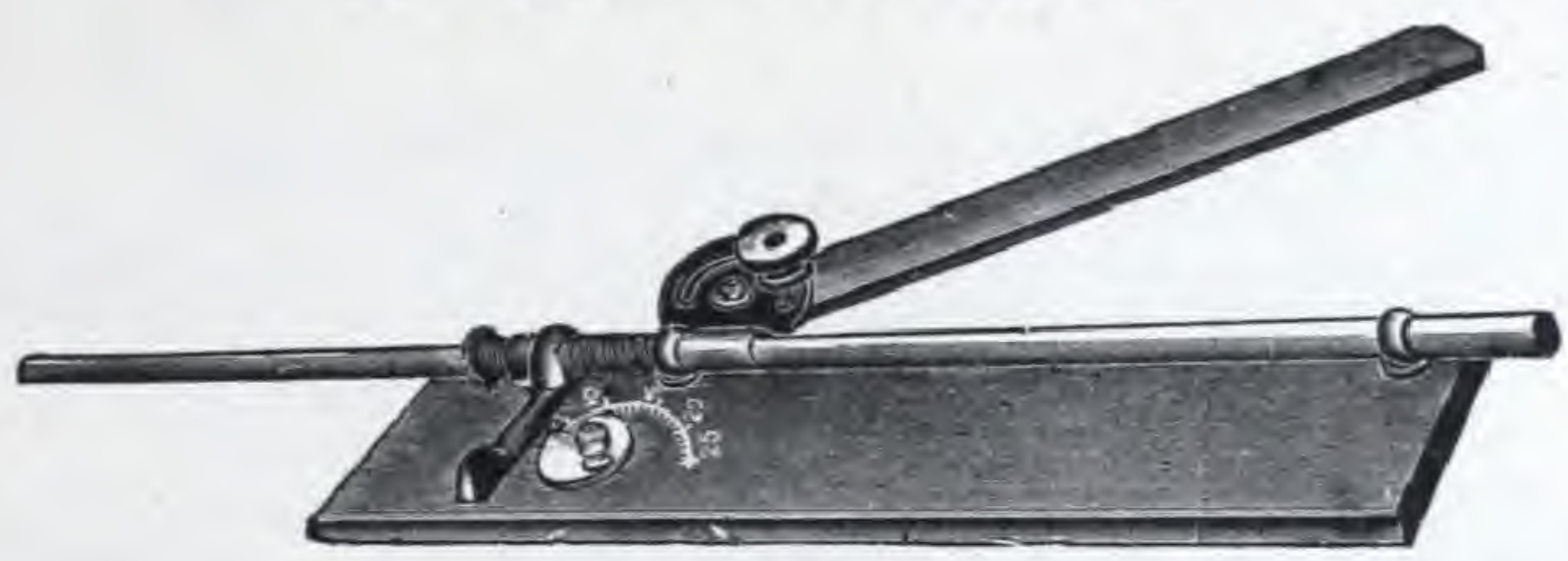
EACH

- 2413 Solid brass, fine finish, Rolling Parallel Rule, 9 inches.....
- 2414 Solid brass, fine finish, Rolling Parallel Rule, 12 inches.....
- 2415 Solid brass, fine finish, Rolling Parallel Rule, 15 inches.....
- 2416 Solid brass, fine finish, Rolling Parallel Rule, 18 inches.....
- 2417 Solid brass, fine finish, Rolling Parallel Rule, 24 inches.....
- 2418 Solid brass, nickel-plated, Rolling Parallel Rule, 9 inches.....
- 2419 Solid brass, nickel-plated, Rolling Parallel Rule, 12 inches.....
- 2420 Solid brass, nickel-plated, Rolling Parallel Rule, 15 inches.....
- 2421 Solid brass, nickel-plated, Rolling Parallel Rule, 18 inches.....
- 2422 Solid brass, nickel-plated, Rolling Parallel Rule, 24 inches.....
- 2422½ Solid steel, Rolling Parallel Rule, extra heavy, 30 inches.....



SECTION LINERS

THE STANDARD SECTION LINER



2423

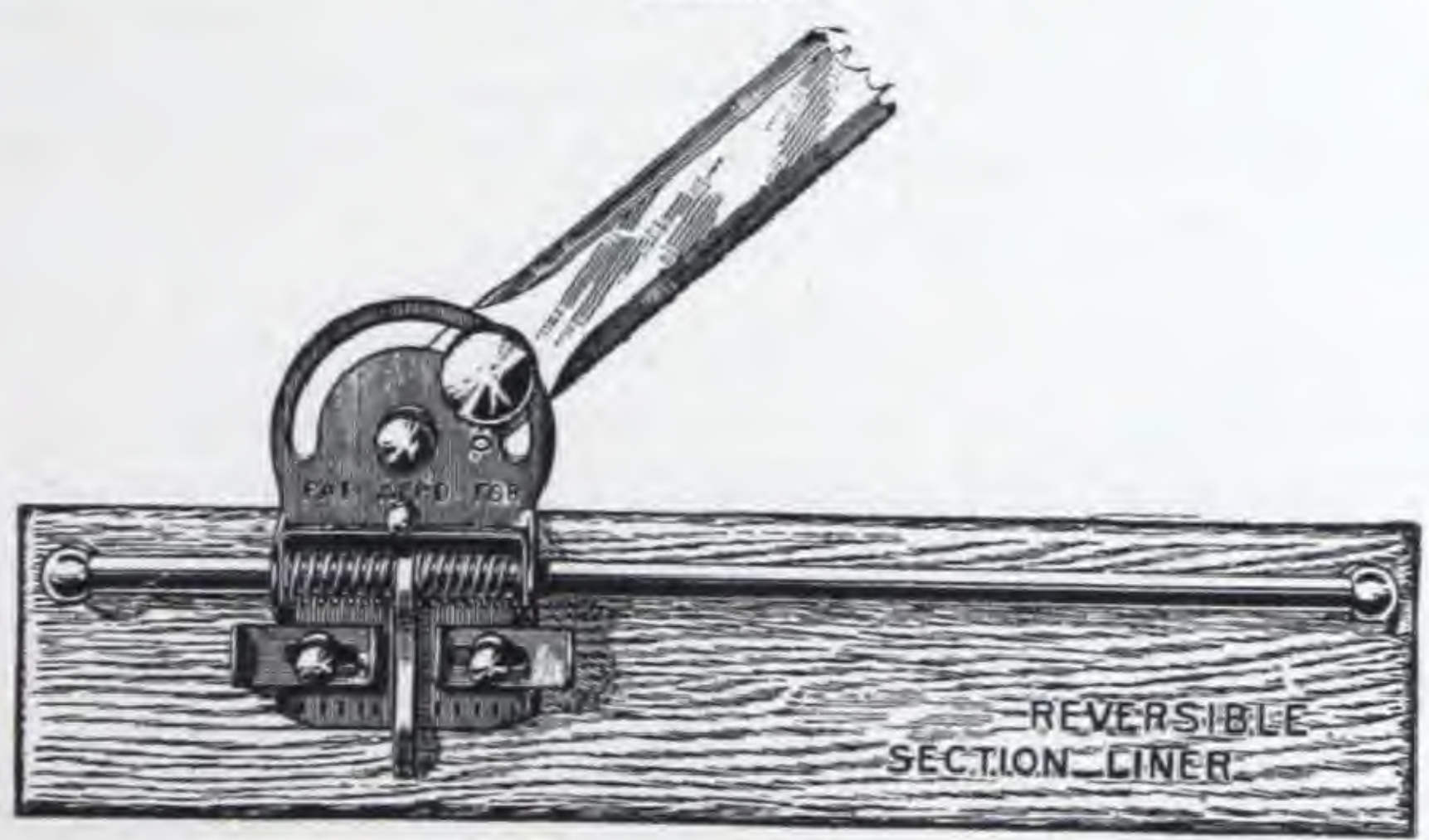
EACH

2423 Standard Section Liner, finished in natural wood and nickel-plated mountings, in imitation morocco case.....

The Standard Section Liner is strong, simple and durable, and is the only practical instrument at a reasonable price adapted to the needs of draughtsmen and pupils in mechanical and architectural drawing classes. It has great range, allowing spaces from 1-1000 to 1/2 inch at any angle without changing position.

REVERSIBLE SECTION LINER

Patented



2424

The reversible section liner, while similar in appearance, has the following variations, or changes, in construction and advantages: It is reversible; that is, it operates both from left to right, and right to left. The bar is stationary, and the instrument complete occupies a space 8 3/4 inches long on the drawing board. The 7-inch rule is made of transparent celluloid, and double beveled.

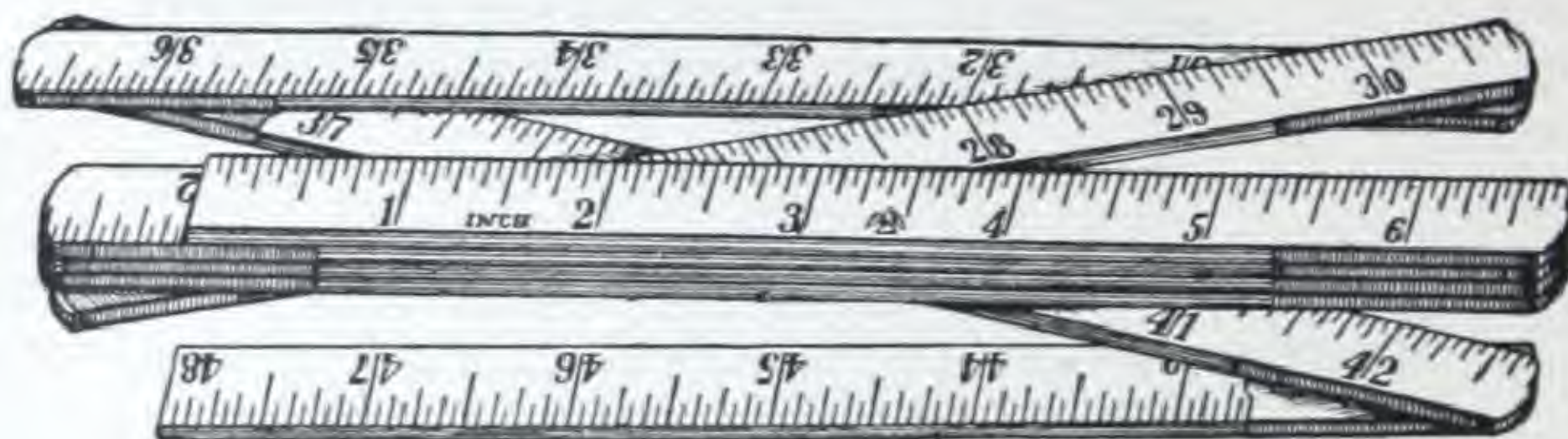
2424 Packed in an imitation morocco covered cardboard box....EACH



## FOLDING POCKET RULES

EXTRA FINE QUALITY

White Enamel



2444C

These Folding Pocket Rules are similar in construction to those listed under No. 2445C, differing only in finish. They have a white enamel coating which is very durable and resists heat or moisture. The black graduations are more legible than on the yellow rules; and as these white finished rules can be cleaned with water, oil or alcohol, their neat appearance can thus be preserved. No rivets visible on the surface that disturb the reading of the scale. The ends are finished with brass tips.

EACH

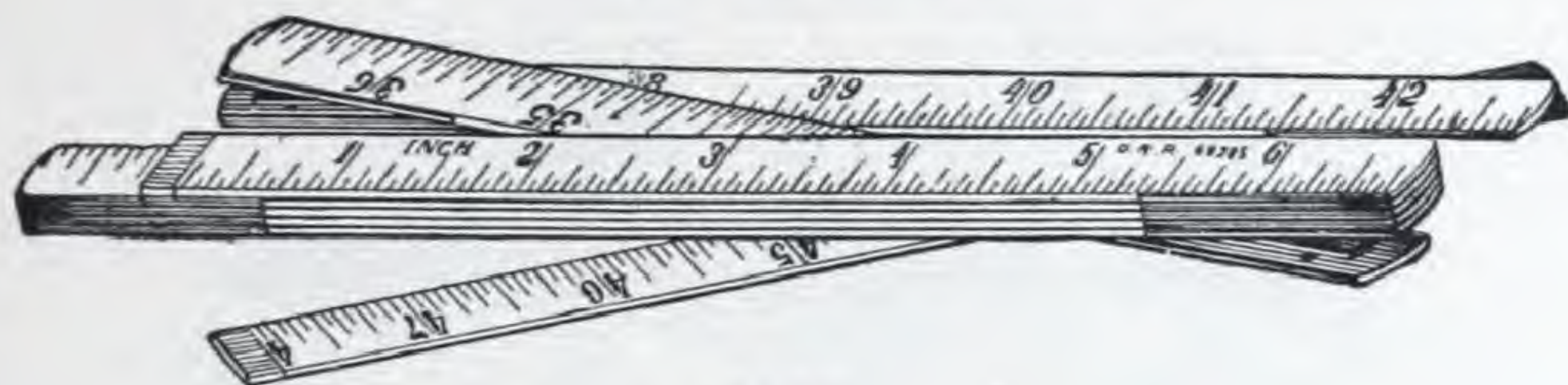
- 2444A Pocket Rule, 2 feet, 4 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....
- 2444B Pocket Rule, 3 feet, 6 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....
- 2444C Pocket Rule, 4 feet, 8 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....
- 2444D Pocket Rule, 5 feet, 10 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....
- 2444E Pocket Rule, 6 feet, 12 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....
- 2444F Pocket Rule, 8 feet, 16 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....
- 2444H Pocket Rule, 4 feet, 8 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{100}$  ft., with springs.....
- 2444I Pocket Rule, 6 feet, 12 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{100}$  ft., with springs.....
- 2444J Pocket Rule, 4 feet, 8 fold, div.,  $\frac{1}{100}$  ft. on both sides, with springs,
- 2444K Pocket Rule, 6 feet, 8 fold, div.,  $\frac{1}{100}$  ft. on both sides, with springs,



## ENGINEERS' FOLDING POCKET RULES

EXTRA FINE QUALITY

Yellow Enamel



2445C

No rivets visible on the surface that disturb the reading of the scale. The ends are provided with brass tips.

EACH

- 2445A Pocket Rule, 2 feet, 4 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....  
 2445B Pocket Rule, 3 feet, 6 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....  
 2445C Pocket Rule, 4 feet, 8 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....  
 2445D Pocket Rule, 5 feet, 10 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....  
 2445E Pocket Rule, 6 feet, 12 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....  
 2445F Pocket Rule, 8 feet, 16 fold, div.,  $\frac{1}{16}$  x  $\frac{1}{16}$  in., with springs.....  
 2445H Pocket Rule, 5 feet, 10 fold, div.,  $\frac{1}{16}$  x 1-100 in., with springs....  
 2445K Pocket Rule, 6 feet, 12 fold, div.,  $\frac{1}{16}$  x 1-100 in., with springs....

## VEST POCKET SIZE

White Enamel



2447A

EACH

- 2447A Pocket Rule, 2 feet, 6 fold, with springs.....  
 2447B Pocket Rule, 3 feet, 9 fold, with springs.....

2447A and 2447B are only  $\frac{3}{8}$  inch wide, and the 3-foot rule measures only  $\frac{3}{8}$  x  $\frac{9}{16}$  x 5 inches. When closed they are very convenient for the pocket.

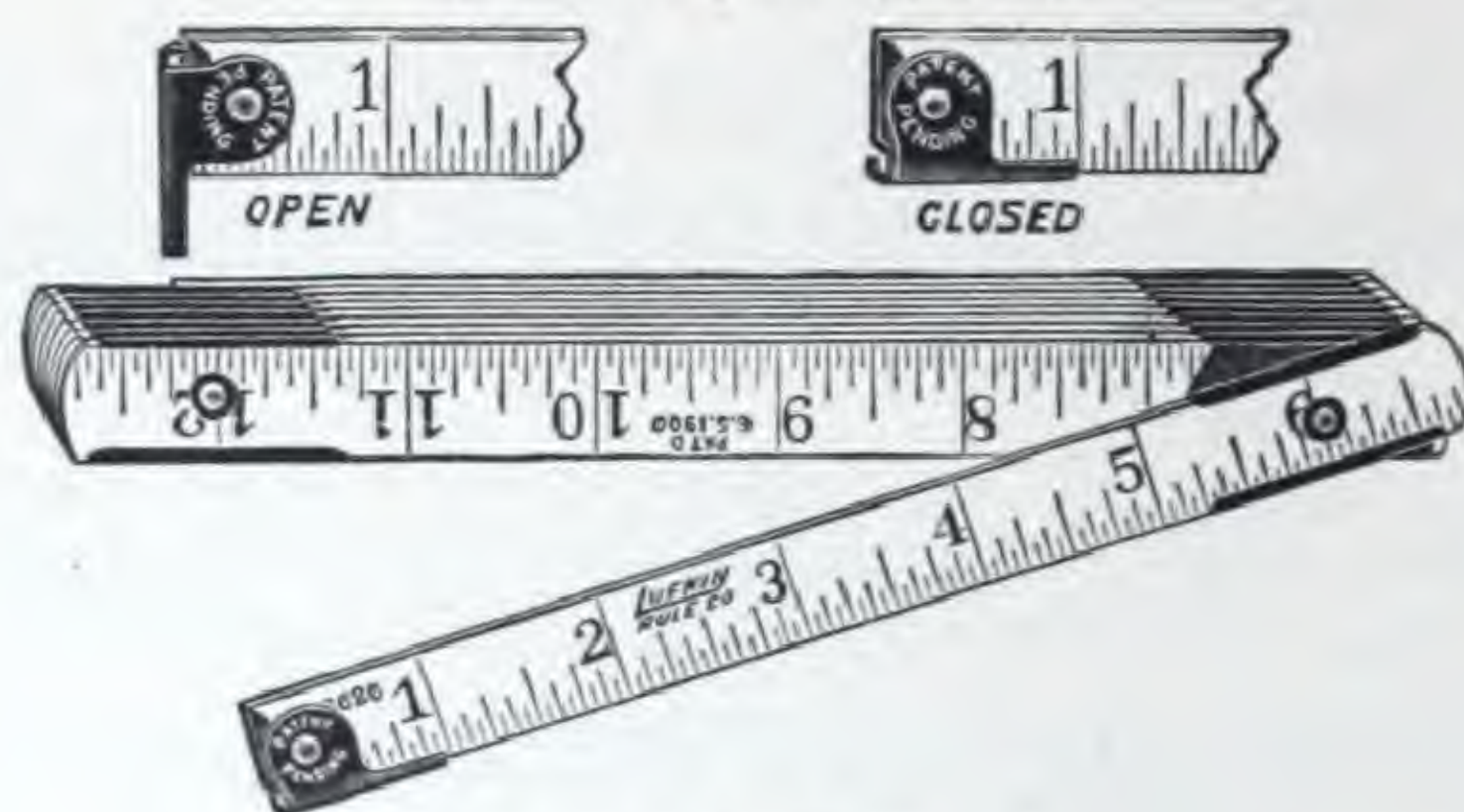


## FLEXIBLE SPRING JOINT RULES

Brass Plated Trimmings

WITH FOLDING HOOK

(Patented June 13, 1916)



Showing Hook Closed

Just the thing for taking measurements out of arms reach, and handy for taking almost any measurement. A small, substantial hook fitted to the first end of Spring Joint Rules, so attached that with but a twist of the finger will fold up and remain flush with the edge of the rule, making it in appearance and for use same as ordinary rules without hook. Zero point falls at inside of hook when open, at extreme end of rule same as regular rules when hook is closed.

### CONCEALED JOINTS

#### Yellow Enameled

Marked Consecutive Inches

EACH

2448Y	4 feet.....
2448Y	5 feet.....
2448Y	6 feet.....
2448Y	8 feet.....

#### White Enameled

Marked Consecutive Inches

EACH

2448W	4 feet.....
2448W	5 feet.....
2448W	6 feet.....
2448W	8 feet.....

### RIVET JOINTS

#### Yellow Enameled

Marked Consecutive Inches

EACH

2448RY	4 feet.....
2448RY	5 feet.....
2448RY	6 feet.....
2448RY	8 feet.....

#### White Enameled

Marked Consecutive Inches

EACH

2448RW	4 feet.....
2448RW	5 feet.....
2448RW	6 feet.....
2448RW	8 feet.....



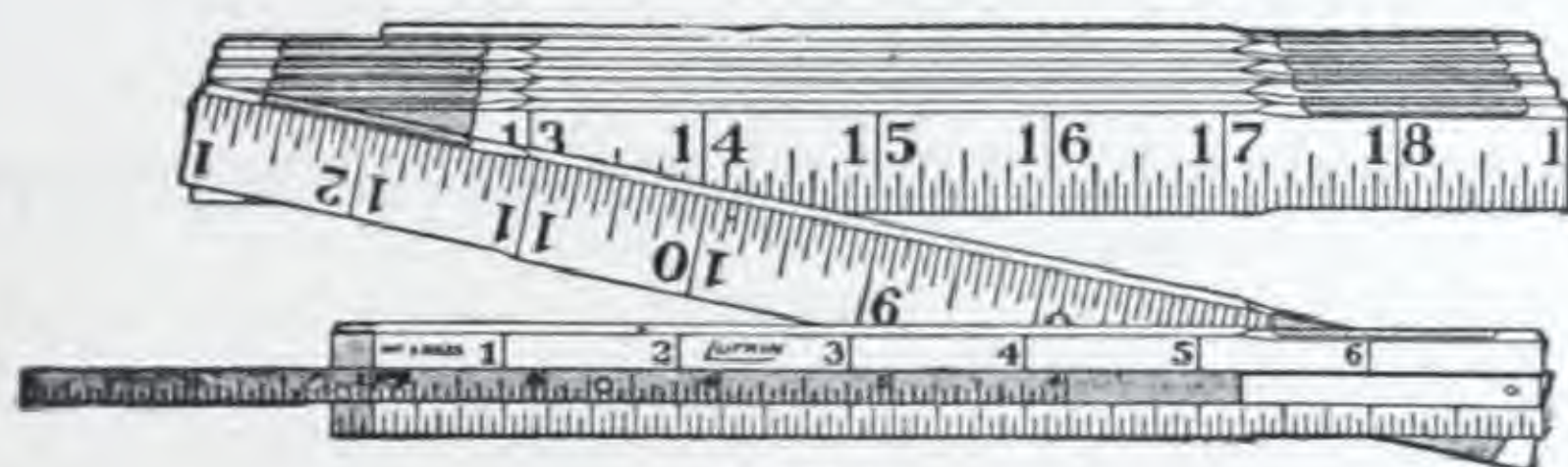
## EXTENSION SPRING JOINT RULE

MADE OF GENUINE BOXWOOD

For  
Inside  
Measurements



For  
Regular  
Measurements



2448½

Particularly designed for taking inside measurements of openings, such as door and window frames, for boilers, etc., and such measurements as are difficult to take with the ordinary folding rule, but serves also every purpose of a common rule in ordinary measuring.

The first section of the rule is fitted with a graduated brass slide which can not come loose or fall out, as it is securely locked at both ends. To obtain inside measurements, open rule to within six inches or less of distance between points to be measured. Extend brass slide by push button to point of measurement. Add measurement on brass slide to that shown at extreme end of rule, which will give you exact distance between points measured. Extension slide admirably adapted to measuring depth of mortises and other holes. The rules are six feet in length, and when extension slide is used give a measuring capacity of six and one-half feet.

Made of GENUINE BOXWOOD, extra heavy, securely fastened at joints, making the rule more rigid when extended than the ordinary folding rule. Graduated both sides in consecutive inches and sixteenths, figures and lines being clear and distinct.

A rule that will especially appeal to carpenters, architects, inspectors, contractors and others.

2448½ 6-foot Extension Rule.....EACH



## FLEXIBLE FOLDING STEEL POCKET RULES

With Patent Stop Joints and Leather Case



2449A

EACH

- 2449A Steel, 1 foot,  $\frac{3}{8}$  inch wide, 4-inch joints, 3 fold.....  
 2449B Steel, 2 feet,  $\frac{3}{8}$  inch wide, 4-inch joints, 6 fold.....  
 2449C Steel, 2 feet,  $\frac{3}{8}$  inch wide, 6-inch joints, 4 fold.....  
 2449D Steel, 3 feet,  $\frac{3}{8}$  inch wide, 6-inch joints, 6 fold.....  
 2449E Steel, 4 feet,  $\frac{3}{8}$  inch wide, 6-inch joints, 8 fold.....  
 2449F Steel, 2 feet,  $\frac{3}{8}$  inch wide. Inches on one side, 10ths on other, 4-inch joints, 6 fold.....  
 2449G Steel, 3 feet,  $\frac{3}{8}$  inch wide. Inches on one side, 10ths on other, 4-inch joints, 9 fold.....

### EXTENSION MEASURES

These Measures are of hardwood with brass trimmings, and are graduated to feet, inches and eighths. They are used for measuring objects which are not accessible for measuring with a tape.



2450A

EACH

- 2450A Extension Measure, 2 fold, 4 feet, extending to 8 feet.....  
 2450B Extension Measure, 2 fold, 5 feet, extending to 10 feet.....  
 2450C Extension Measure, 2 fold, 6 feet, extending to 12 feet.....

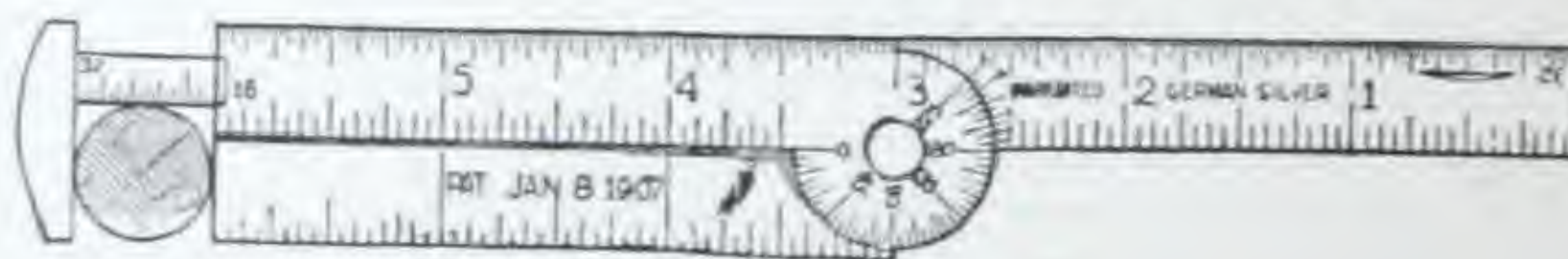


2451A

EACH

- 2451A Extension Measure, 3 fold, 3 feet, extending to 9 feet.....  
 2451B Extension Measure, 3 fold, 4 feet, extending to 12 feet.....  
 2451C Extension Measure, 3 fold, 5 feet, extending to 15 feet.....

### COMBINATION FOLDING POCKET RULE



2449

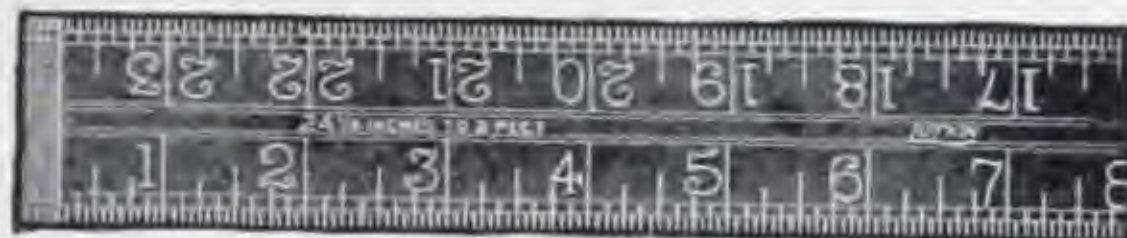
EACH

- 2449 Combination Folding Pocket Rule, German silver, with caliper, 6 inches, 2 fold.....

This Rule is made of spring German silver, accurately and distinctly graduated. It can be used as a caliper gauge, protractor, triangle or try square. The upper edge and caliper arm are graduated in 32ds, and the lower edge in 16ths; the protractor is graduated to five degrees and the vernier reads to one-half degree. It is adjustable to any angle, and the center joint is so constructed that the rule remains firm wherever set.



## SHRINKAGE RULES



## FOR PATTERN MAKERS

Made of Highly Finished Boxwood,  $1\frac{1}{2} \times \frac{1}{8}$  inch, Brass Capped.

Graduated 8ths one side, 16ths on the other side.

EACH

2501	Extreme length, $28\frac{1}{8}$ inches, shrinkage $\frac{1}{16}$ inch per foot.....
2502	Extreme length, 24 2-12 inches, shrinkage 1-12 inch per foot.....
2503	Extreme length, 24 2-10 inches, shrinkage 1-10 inch per foot.....
2504	Extreme length, $24\frac{3}{16}$ inches, shrinkage 3-32 inch per foot.....
2505	Extreme length, $24\frac{1}{4}$ inches, shrinkage $\frac{1}{8}$ inch per foot.....
2506	Extreme length, $24\frac{3}{8}$ inches, shrinkage $\frac{3}{16}$ inch per foot.....
2507	Extreme length, $24\frac{1}{2}$ inches, shrinkage $\frac{1}{4}$ inch per foot.....
2508	Extreme length, $24\frac{5}{8}$ inches, shrinkage $\frac{5}{16}$ inch per foot.....
2509	Extreme length, $24\frac{3}{4}$ inches, shrinkage $\frac{3}{8}$ inch per foot.....
2511	Extreme length, 25 inches, shrinkage $\frac{1}{2}$ inch per foot.....
2512	Extreme length, $25\frac{1}{2}$ inches, shrinkage $\frac{3}{4}$ inch per foot.....
2513	Extreme length, $25\frac{3}{4}$ inches, shrinkage $\frac{7}{8}$ inch per foot.....
2514	Extreme length, $25\frac{7}{8}$ inches, shrinkage $\frac{15}{16}$ inch per foot.....
2515	Extreme length, 26 inches, shrinkage 1 inch per foot.....

Graduated 8ths, 10ths, 12ths and 16ths.

EACH

2516	Extreme length, $24\frac{1}{8}$ inches, shrinkage $\frac{1}{16}$ inch per foot.....
2517	Extreme length, 24 2-12 inches, shrinkage 1-12 inch per foot.....
2518	Extreme length, 24 2-10 inches, shrinkage 1-10 inch per foot.....
2519	Extreme length, $24\frac{3}{16}$ inches, shrinkage 3-32 inch per foot.....
2520	Extreme length, $24\frac{1}{4}$ inches, shrinkage $\frac{1}{8}$ inch per foot.....
2521	Extreme length, $24\frac{3}{8}$ inches, shrinkage $\frac{3}{16}$ inch per foot.....
2522	Extreme length, $24\frac{1}{2}$ inches, shrinkage $\frac{1}{4}$ inch per foot.....
2523	Extreme length, $24\frac{5}{8}$ inches, shrinkage $\frac{5}{16}$ inch per foot.....

The above Rules are strictly high grade in every respect. Guaranteed accurate, and the finest shrinkage rules made, and should not be compared with the cheaper and inferior rules on the market.

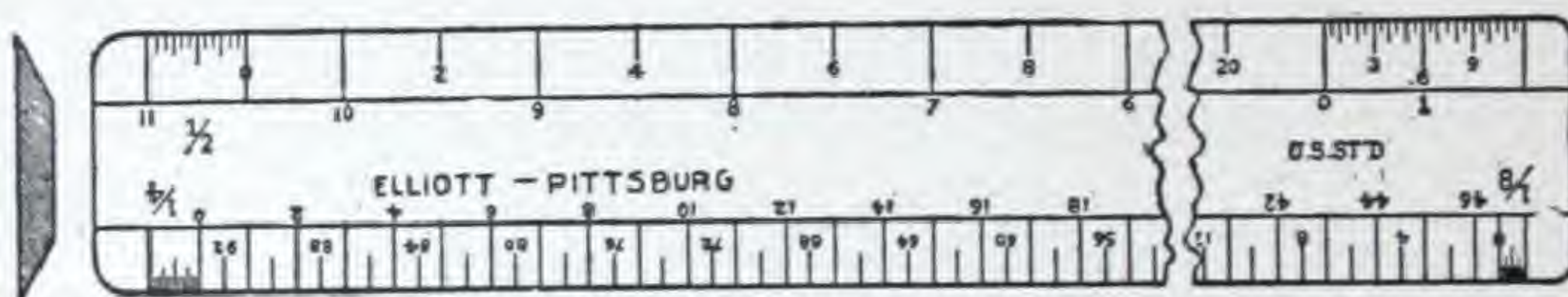


## FLAT BOXWOOD SCALES

### U. S. STANDARD. MACHINE DIVIDED

Flat Scales are easier read, more convenient, less liable to cause errors and cost less to replace than Triangular Scales.

All of our Scales are made of thoroughly seasoned boxwood, and for workmanship and accuracy are unequaled by any other manufacturers.

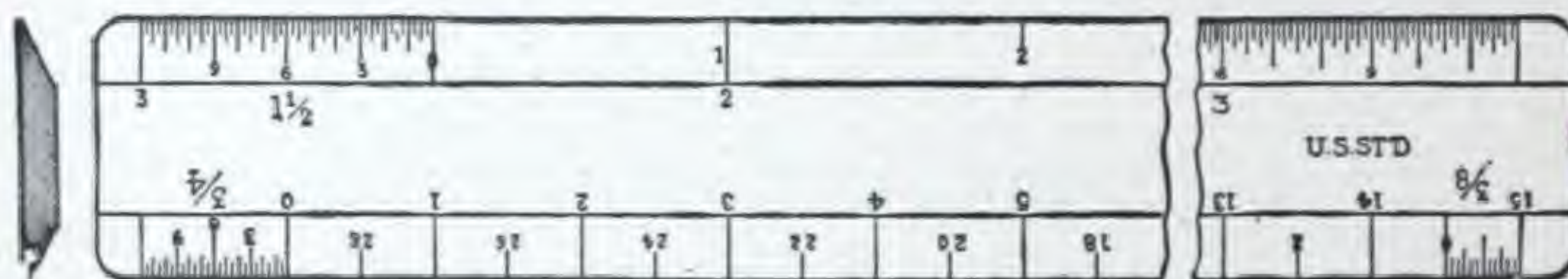


2471

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1 inch to the foot.

EACH

- 2470 Flat Boxwood Scale, 6 inches.....
- 2471 Flat Boxwood Scale, 12 inches.....
- 2472 Flat Boxwood Scale, 12  $\frac{1}{2}$  inches.....
- 2473 Flat Boxwood Scale, 18 inches.....
- 2474 Flat Boxwood Scale, 24 inches.....
- 2472 covers 100 feet on  $\frac{1}{8}$  inch, 50 feet on  $\frac{1}{4}$  inch, and 25 feet on  $\frac{1}{2}$ -inch Scale.



2476

Divided  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $1\frac{1}{2}$ , 3 inches to the foot.

EACH

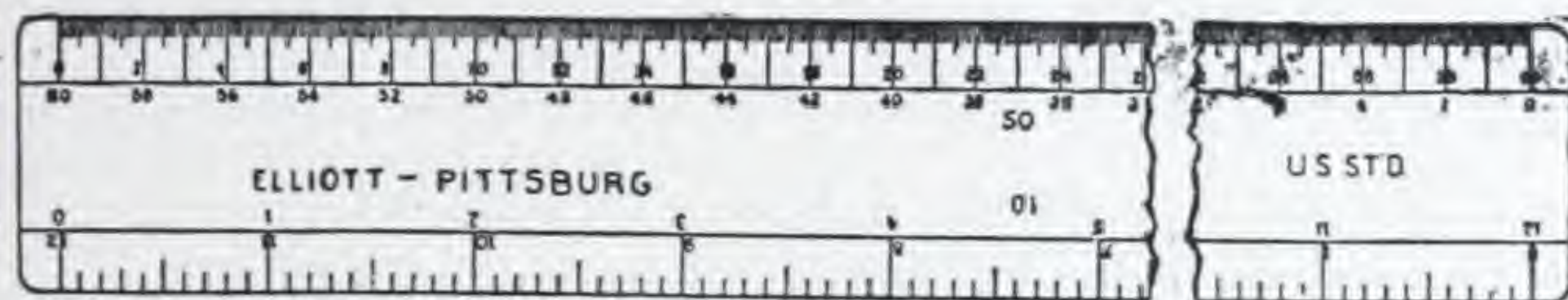
- 2475 Flat Boxwood Scale, 6 inches.....
- 2476 Flat Boxwood Scale, 12 inches.....
- 2477 Flat Boxwood Scale, 18 inches.....
- 2478 Flat Boxwood Scale, 24 inches.....

Special Scales made to order. A sketch showing divisions and length desired should always accompany an order for special Scales, together with remittance of 25 to 50 cents more than list price of similar Scale.



## FLAT BOXWOOD SCALES—Continued.

## U. S. STANDARD. MACHINE DIVIDED

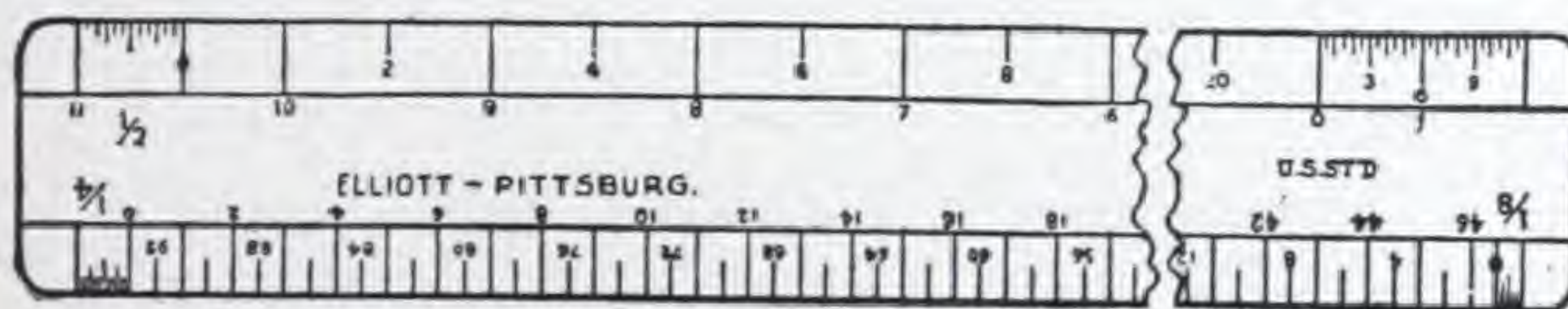


2480

## CHAIN SCALES

EACH

- 2479 Flat Boxwood Chain Scales, 6 in., div. 10 x 50 parts to the inch..  
 2480 Flat Boxwood Chain Scales, 12 in., div. 10 x 50 parts to the inch..  
 2481 Flat Boxwood Chain Scales, 6 in., div. 20 x 40 parts to the inch..  
 2482 Flat Boxwood Chain Scales, 12 in., div. 20 x 40 parts to the inch..  
 2483 Flat Boxwood Chain Scales, 6 in., div. 30 x 60 parts to the inch..  
 2484 Flat Boxwood Chain Scales, 12 in., div. 30 x 60 parts to the inch..  
 2485 Flat Boxwood Chain Scales, 6 in., div. 80 x 100 parts to the inch..  
 2486 Flat Boxwood Chain Scales, 12 in., div. 80 x 100 parts to the inch..



2488

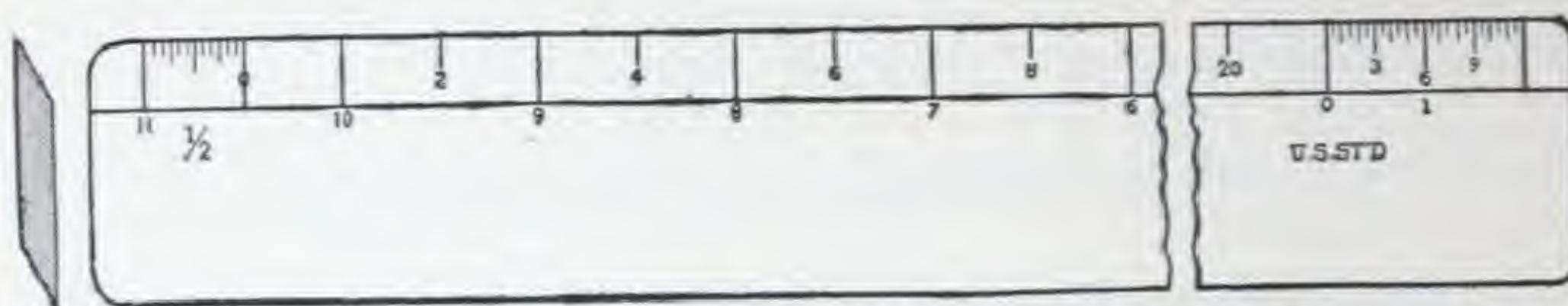
Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1,  $\frac{3}{8}$ ,  $\frac{3}{4}$ ,  $1\frac{1}{2}$  and 3 inches to the foot.

EACH

- 2487 Flat Boxwood Scale, 6 inches, both sides beveled and divided.....  
 2488 Flat Boxwood Scale, 12 inches, both sides beveled and divided.....  
 2489 Flat Boxwood Scale, 18 inches, both sides beveled and divided.....  
 2490 Flat Boxwood Scale, 24 inches, both sides beveled and divided.....



## FLAT BOXWOOD SCALES—Continued.



2491

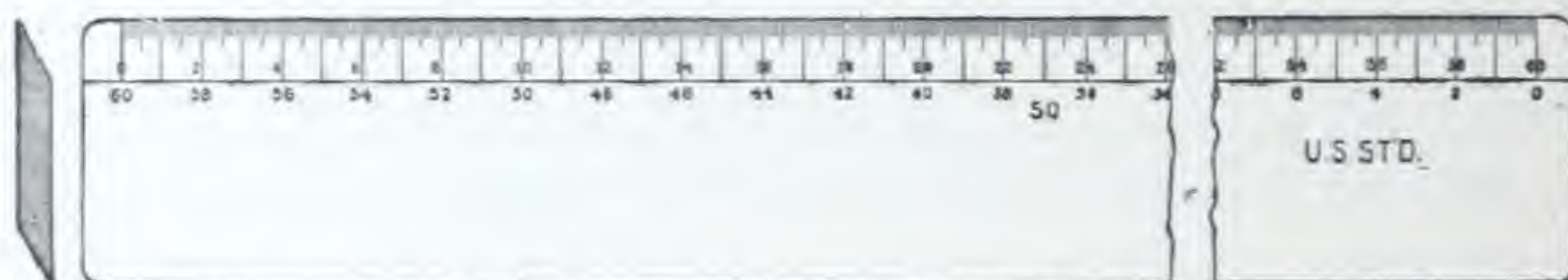
Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$  and 1 inch to the foot.

## OPPOSITE BEVEL BOXWOOD SCALES

These Scales are an improvement over the regular flat scales, as they are more readily picked up, and present but one graduated bevel to the eye when in use.

EACH

- 2491 Opposite Bevel Boxwood Scale, 6 inches.....  
 2492 Opposite Bevel Boxwood Scale, 12 inches.....  
 2493 Opposite Bevel Boxwood Scale, 6 inches.....  
 2494 Opposite Bevel Boxwood Scale, 12 inches.....



2496

Divided 10 x 50 parts to the inch.

EACH

- 2495 Flat Boxwood Chain Scale, beveled on opposite sides, 6 inches,  
 10 x 50 parts to the inch.....  
 2496 Flat Boxwood Chain Scale, beveled on opposite sides, 12 inches,  
 10 x 50 parts to the inch.....  
 2497 Flat Boxwood Chain Scale, beveled on opposite sides, 12 inches,  
 20 x 40 parts to the inch.....  
 2498 Flat Boxwood Chain Scale, beveled on opposite sides, 12 inches,  
 30 x 60 parts to the inch.....  
 2499 Flat Boxwood Chain Scale, beveled on opposite sides, 12 inches,  
 80 x 100 parts to the inch.....

Special Scales of any desired graduations or combinations made to order on short notice. To insure prompt attention and to avoid delays, always send sketch showing graduations desired.

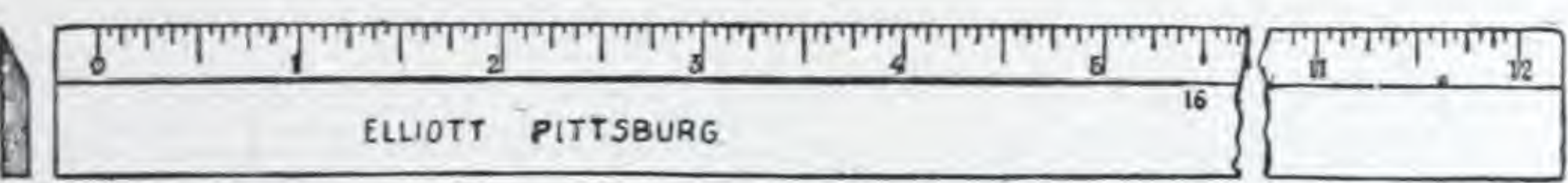


FLAT BOXWOOD SCALES—Continued.

One Edge Beveled, with but One Division on each Side

U. S. Standard. Machine Divided.

Scales with various divisions, which have the tendency to present the wrong scale, oftentimes cause a loss of time in finding the required divisions. These Scales were designed to overcome this very objectionable feature. These are made somewhat narrower than the Regular Flat Boxwood Scale, but of the same material and with same care.



2500

12 inches long, one division on each scale.

- Architects' Scales, division either 3-32,  $\frac{3}{16}$ ,  $\frac{1}{16}$ ,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$ , 2, 3, 4 inch to the foot.
- Engineers' Scales, division either 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch.

- EACH
- 2500

Single Scale, 12 inches, division as selected (excepting 80 or 100 parts to the inch).....
- 2501

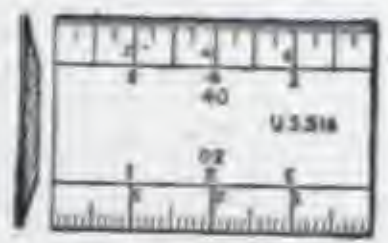
Single Scale, 12 inches, divided either 80 or 100 parts to the inch...
- 2502

Per set of 4 Scales, in case, divisions as selected.....
- 2503

Per set of 8 Scales, in case, divisions as selected.....
- 2504

Per set of 12 Scales, in polished wooden box, lined with felt and stamped with divisions, as selected.....

In Ordering Above, Please State Divisions Wanted



2505

- EACH
- 2505

Flat Boxwood Offset Scale, 2 in., div. 10 x 50 parts to the inch....
- 2506

Flat Boxwood Offset Scale, 2 in., div. 20 x 40 parts to the inch....
- 2507

Flat Boxwood Offset Scale, 2 in., div. 30 x 60 parts to the inch....
- 2508

Flat Boxwood Offset Scale, 2 in., div. 80 x 100 parts to the inch....

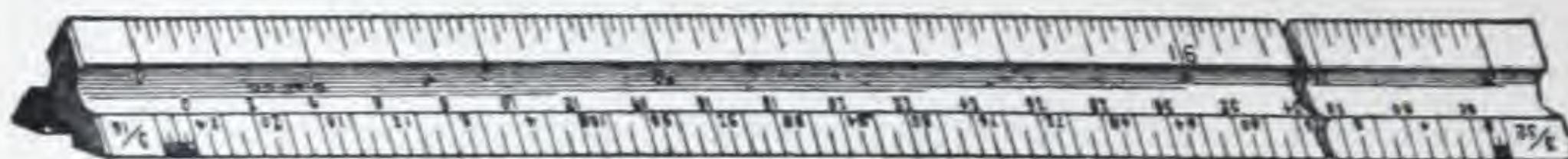
Special Scales made to order.



## TRIANGULAR BOXWOOD SCALES

FOR ARCHITECTS AND MECHANICAL ENGINEERS

U. S. Standard. Machine Divided



2512

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1,  $\frac{3}{8}$ ,  $\frac{3}{4}$ ,  $1\frac{1}{2}$ ,  $\frac{3}{16}$ , 3-32, 3 inch to the foot,  $\frac{1}{16}$  inch.

EACH

- 2511 Triangular Boxwood Scale, 6 inches.....
- 2512 Triangular Boxwood Scale, 12 inches.....
- 2513 Triangular Boxwood Scale, 18 inches.....
- 2514 Triangular Boxwood Scale, 24 inches.....

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{8}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$ , 2, 3, 4 inch to the foot,  $\frac{1}{16}$  inch.

EACH

- 2516 $\frac{1}{2}$  Triangular Boxwood Scale, 12 inches.....
- 2517 $\frac{1}{2}$  Triangular Boxwood Scale, 18 inches.....
- 2518 $\frac{1}{2}$  Triangular Boxwood Scale, 24 inches.....

## FOR CIVIL ENGINEERS AND SURVEYORS



2516

Divided 10, 20, 30, 40, 50, 60 parts to the inch.

EACH

- 2515 Triangular Boxwood Chain Scale, 6 inches.....
- 2516 Triangular Boxwood Chain Scale, 12 inches.....
- 2517 Triangular Boxwood Chain Scale, 18 inches.....
- 2518 Triangular Boxwood Chain Scale, 24 inches.....
- 2519 Triangular Boxwood Chain Scale, 12 inches, divided 20, 30, 40, 50, 60, 80 parts to the inch.....
- 2520 Triangular Boxwood Chain Scale, 12 inches, divided 100, 200, 300, 400, 500, 600 parts to the foot.....

Triangular Scales, with any other Divisions, made to order

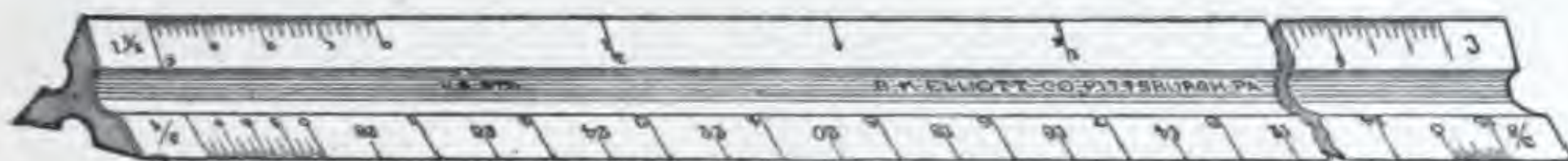


# NEW SHAPE TRIANGULAR BOXWOOD SCALES FOR ARCHITECTS AND MECHANICAL ENGINEERS

U. S. Standard. Machine Divided



The shape of these Triangular Scales prevents the wearing of the surface from contact with the drawing while using the scale, and it affords a better angle of vision than the usual shape. The divisions will wear away quicker on the edges, however, than on Regular Shape.



2525

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1,  $\frac{3}{8}$ ,  $\frac{3}{4}$ ,  $1\frac{1}{2}$  and 3,  $\frac{3}{16}$ ,  $\frac{3}{32}$  inch to the foot  $\frac{1}{16}$  inch.

EACH

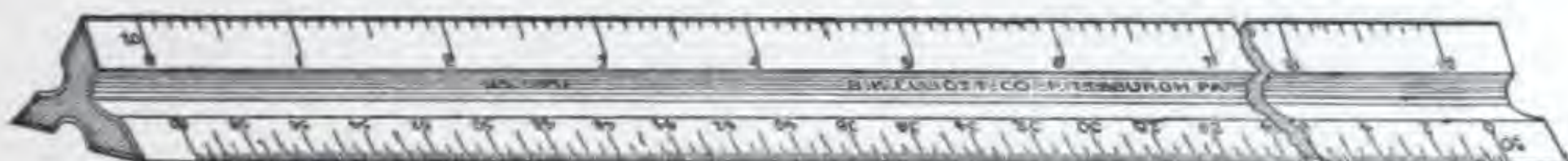
2524 New Shape Boxwood Scale, 6 inches.....

2525 New Shape Boxwood Scale, 12 inches.....

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$ , 3, 4 inch to the foot,  $\frac{1}{16}$  inch.

2526 New Shape Boxwood Scale, 12 inches.....

## FOR CIVIL ENGINEERS AND SURVEYORS



2528

Divided 10, 20, 30, 40, 50, 60 parts to the inch.

EACH

2527 New Shape Boxwood Chain Scale, 6 inches.....

2528 New Shape Boxwood Chain Scale, 12 inches.....

Divided 20, 30, 40, 50, 60, 80 parts to the inch.

2529 New Shape Boxwood Chain Scale, 12 inches.....

## TRIANGULAR SCALE GUARDS



2530

EACH

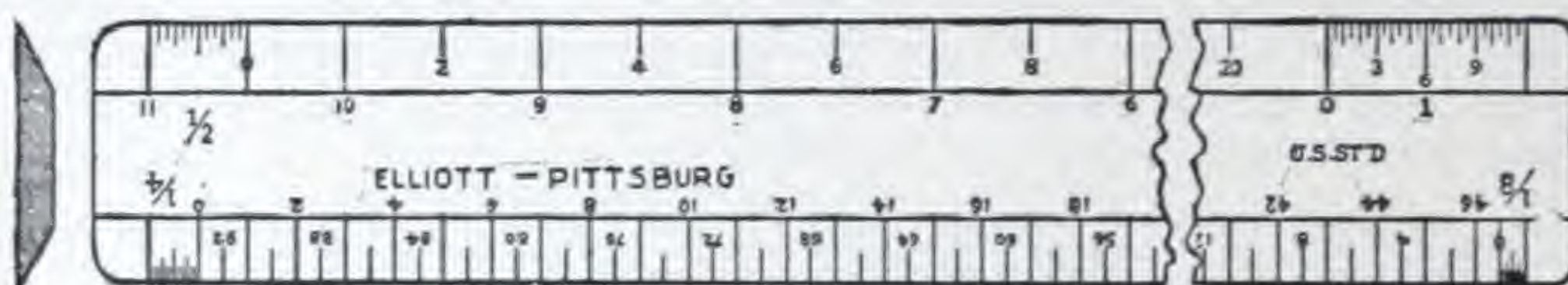
2530 Triangular Scale Guard, nickel-plated.....



## FLAT WHITE EDGE SCALES

U. S. Standard. Machine Divided.

Our Scales with celluloid edges are made of thoroughly seasoned boxwood, and have graduations on white inlaid celluloid, thus showing the graduations very distinctly.



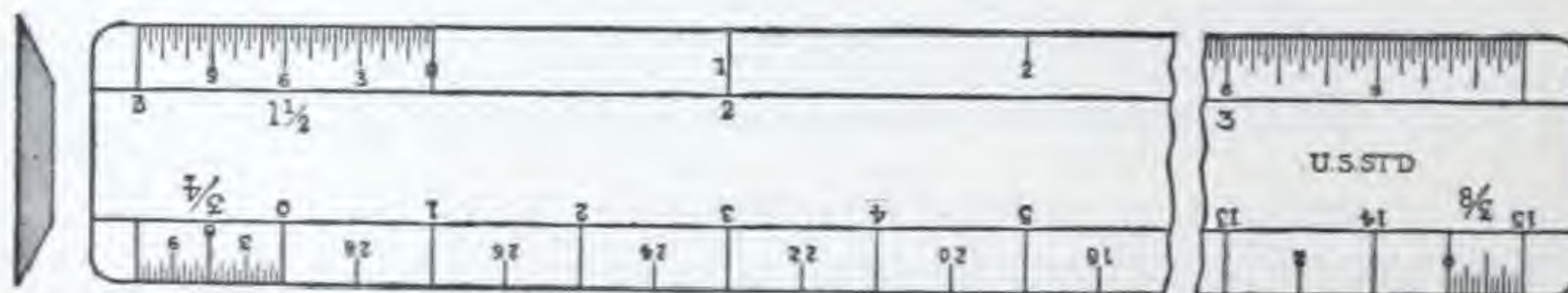
2532

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1 inch to the foot.

EACH

- 2531 Flat White Edge Scale, 6 inches.....
- 2532 Flat White Edge Scale, 12 inches.....
- 2533 Flat White Edge Scale, 12½ inches.....
- 2534 Flat White Edge Scale, 18 inches.....
- 2535 Flat White Edge Scale, 24 inches.....

2533 covers 100 ft. on  $\frac{1}{8}$  in., 50 ft. on  $\frac{1}{4}$  in., and 25 ft. on  $\frac{1}{2}$  in. scale.



2537

Divided  $\frac{3}{8}$ ,  $\frac{3}{4}$ , 1½, 3 inches to the foot.

EACH

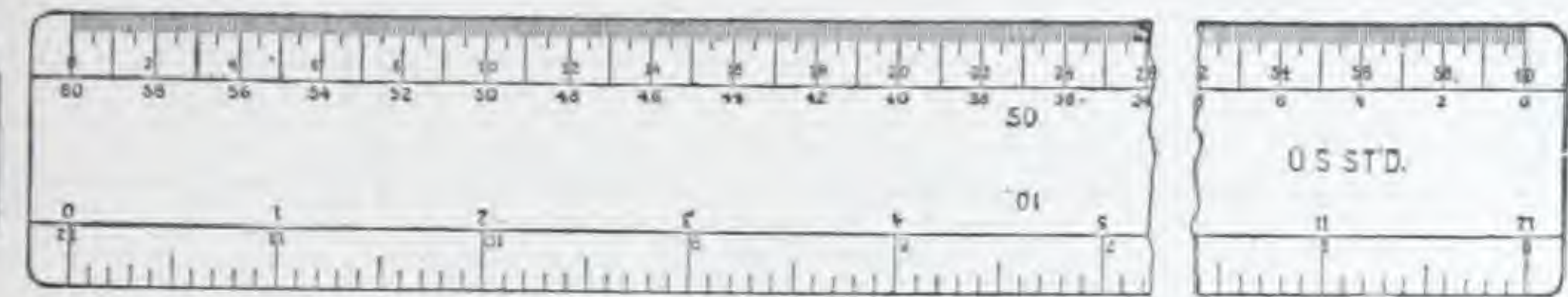
- 2536 Flat White Edge Scale, 6 inches.....
- 2537 Flat White Edge Scale, 12 inches.....
- 2538 Flat White Edge Scale, 18 inches.....
- 2539 Flat White Edge Scale, 24 inches.....

Scales of any Graduation or Combination Made to Order on Short Notice



FLAT WHITE EDGE SCALES—Continued.

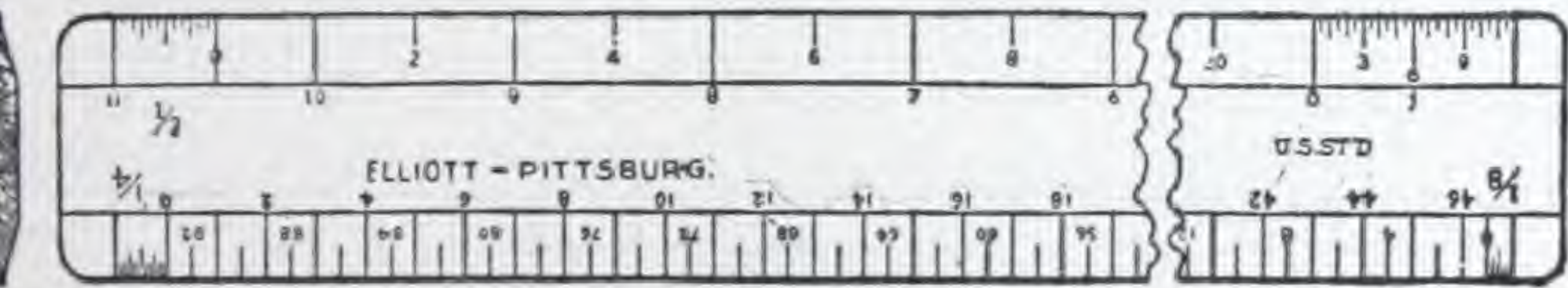
U. S. Standard. Machine Divided



2541

EACH

- 2540 Flat White Edge Chain Scale, 6", div. 10 x 50 parts to the inch..
- 2541 Flat White Edge Chain Scale, 12", div. 10 x 50 parts to the inch..
- 2542 Flat White Edge Chain Scale, 6", div. 20 x 40 parts to the inch..
- 2543 Flat White Edge Chain Scale, 12", div. 20 x 40 parts to the inch..
- 2544 Flat White Edge Chain Scale, 6", div. 30 x 60 parts to the inch..
- 2545 Flat White Edge Chain Scale, 12", div. 30 x 60 parts to the inch..
- 2546 Flat White Edge Chain Scale, 6", div. 80 x 100 parts to the inch..
- 2547 Flat White Edge Chain Scale, 12", div. 80 x 100 parts to the inch..



2554

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1,  $\frac{3}{8}$ ,  $\frac{3}{4}$ ,  $1\frac{1}{2}$ , 3 inch to the foot.

EACH

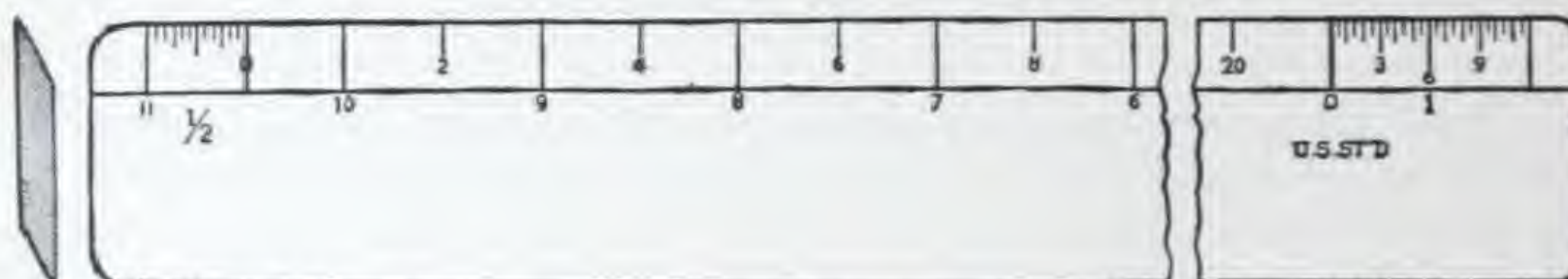
- 2553 Flat White Edge Scale, 6", both sides beveled and divided.....
- 2554 Flat White Edge Scale, 12", both sides beveled and divided.....
- 2555 Flat White Edge Scale, 18", both sides beveled and divided.....
- 2556 Flat White Edge Scale, 24", both sides beveled and divided.....



## FLAT WHITE EDGE SCALES—Continued

U. S. Standard. Machine Divided

## OPPOSITE BEVEL WHITE EDGE SCALES



2558

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1 inch to the foot.

EACH

2557 Opposite Bevel White Edge Scale, 6 inches.....

2558 Opposite Bevel White Edge Scale, 12 inches.....

Divided  $\frac{3}{8}$ ,  $\frac{3}{4}$ ,  $1\frac{1}{2}$  and 3 inches to the foot.

2559 Opposite Bevel White Edge Scale, 6 inches.....

2560 Opposite Bevel White Edge Scale, 12 inches.....



2562

EACH

2561 Opposite Bevel White Edge Chain Scale, 6 inches, div. 10 x 50 parts to the inch.....

2562 Opposite Bevel White Edge Chain Scale, 12 inches, div. 10 x 50 parts to the inch.....

2563 Opposite Bevel White Edge Chain Scale, 12 inches, div. 20 x 40 parts to the inch.....

2564 Opposite Bevel White Edge Chain Scale, 12 inches, div. 30 x 60 parts to the inch.....

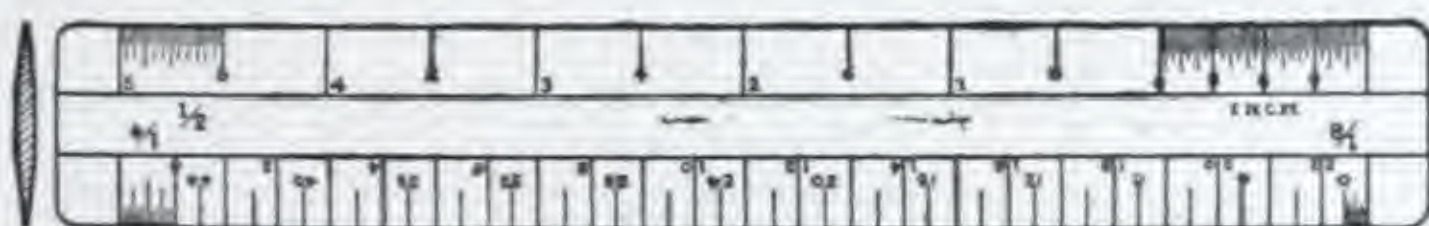
2565 Opposite Bevel White Edge Chain Scale, 12 inches, div. 80 x 100 parts to the inch.....



## FLAT WHITE EDGE SCALES—Continued.

U. S. Standard. Machine Divided.

## POCKET WHITE EDGE SCALE



2566

EACH

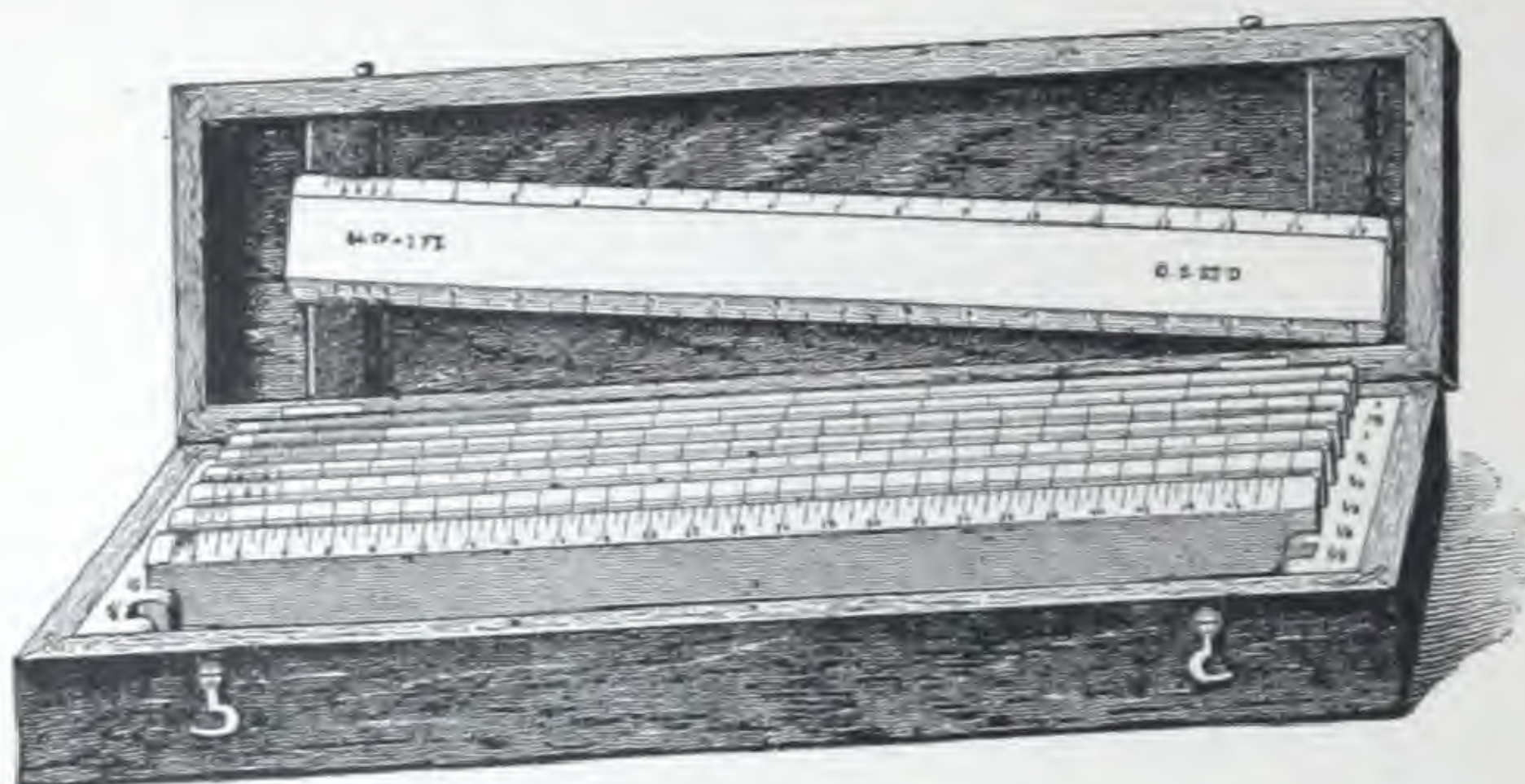
- 2566 Flat White Edge Scale, 6 inches, both sides beveled and divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1,  $\frac{3}{4}$ ,  $1\frac{1}{2}$  and 3 inches to the foot, less than 1 inch wide, in leather sheath, very convenient for the pocket. . . . .
- 2567 Same as 2566, but divided 10, 20, 30, 50 parts to inch. . . . .
- 2568 Same as 2566, but divided 10, 50, 30, 60 parts to inch. . . . .
- 2569 Same as 2566, but divided 10, 20, 40, 60 parts to inch. . . . .
- 2570 Same as 2566, but divided 20, 40, 80, 100 parts to inch. . . . .
- 2571 Same as 2566, but divided 10, 40, 50, 60 parts to inch. . . . .
- 2572 Same as 2566, but divided 10, 40, 30, 50 parts to inch. . . . .
- 2573  $\frac{1}{2}$  Same as 2566, but divided 10, 50, 20, 40 parts to inch. . . . .
- 2574  $\frac{1}{2}$  Same as 2566, but divided 20, 40, 30, 60 parts to inch. . . . .
- 2575  $\frac{1}{2}$  Same as 2566, but divided 10, 20, 30, 40 parts to inch. . . . .



# FLAT WHITE EDGE SCALES IN SETS

IN PARTITIONED MAHOGANY BOXES

U. S. STANDARD, MACHINE DIVIDED



2625

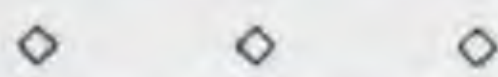
Nos. 2620 to 2623 have two different divisions, one on each edge, numbered to read both ways.

	PER SET
2620 Set of 4 White Edge Scales, 12 inches, divided $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1, $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ and 3 inches to the foot.....	
2621 Set of 6 White Edge Scales, 12 inches, divided $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1, $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ , 3, 2, 4, 6 and 12 inches to the foot.....	
2622 Set of 6 White Edge Scales, 12 inches, divided $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1, $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ and 3, $\frac{3}{16}$ , $\frac{3}{8}$ , 6 and 12 inches to the foot.....	
2623 Set of 4 White Edge Scales, 12 inches, divided 10, 20, 30, 40, 50, 60, 80 and 100 parts to the inch.....	

Nos. 2624 to 2628 have same division on both edges, one edge reading from left to right, other edge from right to left.

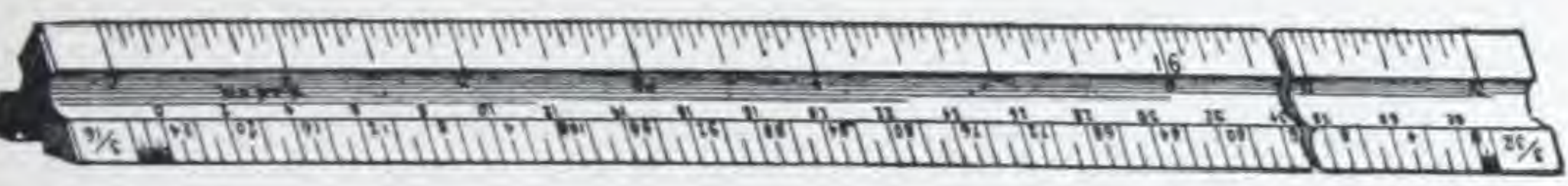
	PER SET
2624 Set of 4 White Edge Scales, 12 inches, divided $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ and 1 inch to the foot.....	
2625 Set of 8 White Edge Scales, 12 inches, divided $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1, $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ and 3 inches to the foot.....	
2626 Set of 12 White Edge Scales, 12 inches, divided, $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1, $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ , 3, 2, 4, 6 and 12 inches to the foot.....	
2627 Set of 12 White Edge Scales, 12 inches, divided $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1, $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ , 3, $\frac{3}{16}$ , $\frac{3}{8}$ , 6 and 12 inches to the foot.....	
2628 Set of 8 White Edge Scales, 12 inches, divided 10, 20, 30, 40, 50, 60, 80 and 100 parts to the inch.....	





TRIANGULAR WHITE EDGE SCALES

U. S. Standard. Machine Divided.



2574

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1,  $\frac{3}{8}$ ,  $\frac{3}{4}$ ,  $1\frac{1}{2}$ , 3,  $\frac{1}{16}$ ,  $\frac{3}{32}$  inches to the foot,  $\frac{1}{16}$  inch.

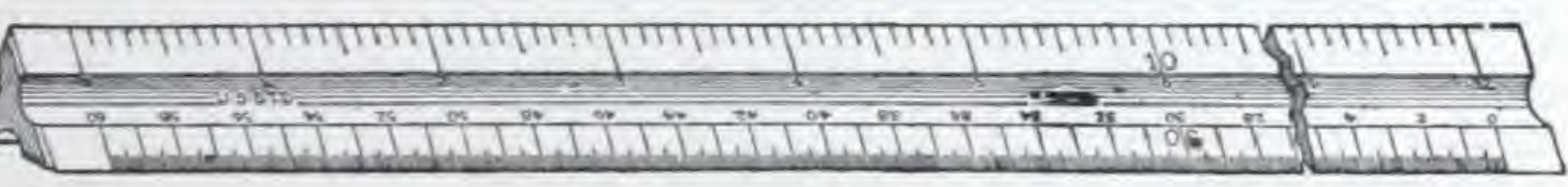
EACH

- 2573 Triangular White Edge Scale, 6 inches.....
- 2574 Triangular White Edge Scale, 12 inches.....
- 2575 Triangular White Edge Scale, 18 inches.....
- 2576 Triangular White Edge Scale, 24 inches.....

Divided,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1,  $\frac{3}{8}$ ,  $\frac{3}{4}$ ,  $1\frac{1}{2}$ , 2, 3, 4 inches to the foot,  $\frac{1}{16}$  inch.

- 2577 Triangular White Edge Scale, 12 inches.....
- 2578 Triangular White Edge Scale, 18 inches.....
- 2579 Triangular White Edge Scale, 24 inches.....

FOR CIVIL ENGINEERS AND SURVEYORS



2581

Divided 10, 20, 30, 40, 50 and 60 parts to the inch.

EACH

- 2580 Triangular White Edge Chain Scale, 6 inches.....
- 2581 Triangular White Edge Chain Scale, 12 inches.....
- 2582 Triangular White Edge Chain Scale, 18 inches.....
- 2583 Triangular White Edge Chain Scale, 24 inches.....
- 2584 Triangular White Edge Chain Scale, 12 inches, divided 20, 30, 40, 50, 60, 80 parts to the inch.....
- 2585 Triangular White Edge Chain Scale, 12 inches, divided 100, 200, 300, 400, 500 and 600 parts to the foot.....

Triangular Scales, with any other Divisions, Made to Order



## TRIANGULAR WHITE EDGE SCALES—Continued.

## U. S. Standard. Machine Divided



Regular Shape

Our Triangular White Edge Scales are made in two styles—the **Regular** shape and the **New** shape—as shown in illustrations. On the Regular shape Scales the full surface of two faces are on the drawing, causing a greater wearing surface



New Shape

but the divisions are not worn away on the edges as quickly as on the New shape. On the latter style, however, the visual angle is such that it affords an easier reading of the scales.

## FOR ARCHITECTS AND MECHANICAL ENGINEERS



2587

Divided  $\frac{3}{32}$ ,  $\frac{3}{16}$ ,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$ , 3 inches to the foot,  $\frac{1}{16}$  inch.

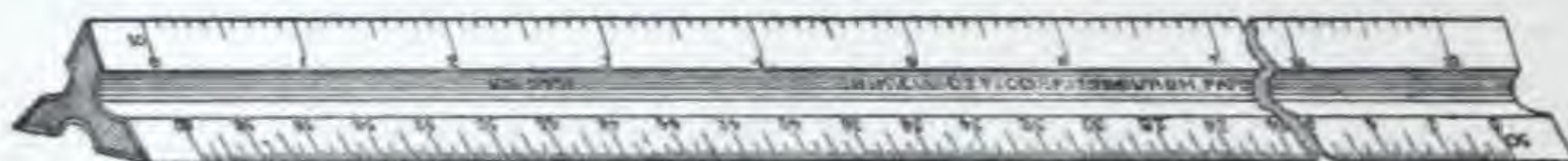
EACH

- 2586 New Shape Triangular White Edge Scale, 6 inches.....
- 2587 New Shape Triangular White Edge Scale, 12 inches.....
- 2588 New Shape Triangular White Edge Scale, 18 inches.....
- 2589 New Shape Triangular White Edge Scale, 24 inches.....

Divided  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$ , 2, 3, 4 inches to the foot,  $\frac{1}{16}$  inch.

- 2590 Improved Triangular White Edge Scale, 12 inches.....
- 2591 Improved Triangular White Edge Scale, 18 inches.....
- 2592 Improved Triangular White Edge Scale, 24 inches.....

## FOR CIVIL ENGINEERS AND SURVEYORS



2594

Divided 10, 20, 30, 40, 50, 60 parts to the inch.

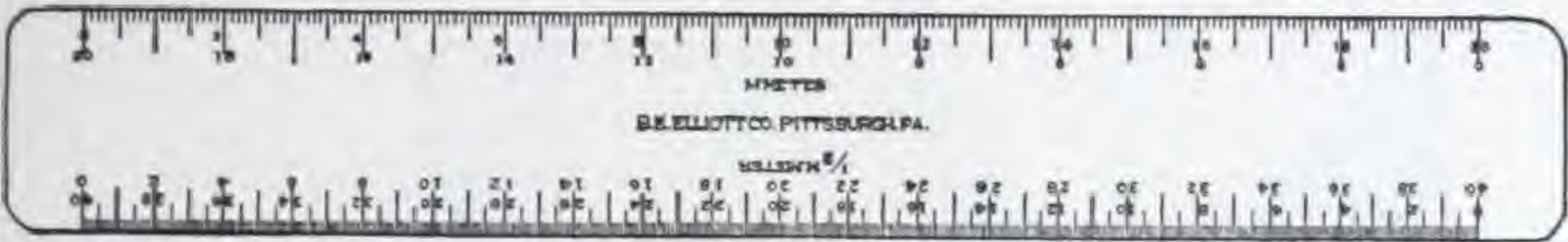
EACH

- 2593 New Shape Triangular White Edge Chain Scale, 6 inches.....
- 2594 New Shape Triangular White Edge Chain Scale, 12 inches.....
- 2595 New Shape Triangular White Edge Chain Scale, 18 inches.....
- 2596 New Shape Triangular White Edge Chain Scale, 24 inches.....
- 2597 New Shape Triangular White Edge Chain Scale, 12 inches, divided  
20, 30, 40, 50, 60, 80 parts to the inch. ....
- 2598 New Shape Triangular White Edge Chain Scale, 12 inches, divided  
100, 200, 300, 400, 500 and 600 parts to the foot.....

**Triangular Scales, with any other Divisions, Made to Order**



FLAT BOXWOOD METRIC SCALES



2599

EACH

- 2599 Flat Boxwood Metric Scale, 10 cm., div. mm. × half mm.....
- 2600 Flat Boxwood Metric Scale, 20 cm., div. mm. × half mm.....
- 2601 Flat Boxwood Metric Scale, 30 cm., div. mm. × half mm.....
- 2602 Flat Boxwood Metric Scale, 50 cm., div. mm. × half mm.....

METALLIC SCALES



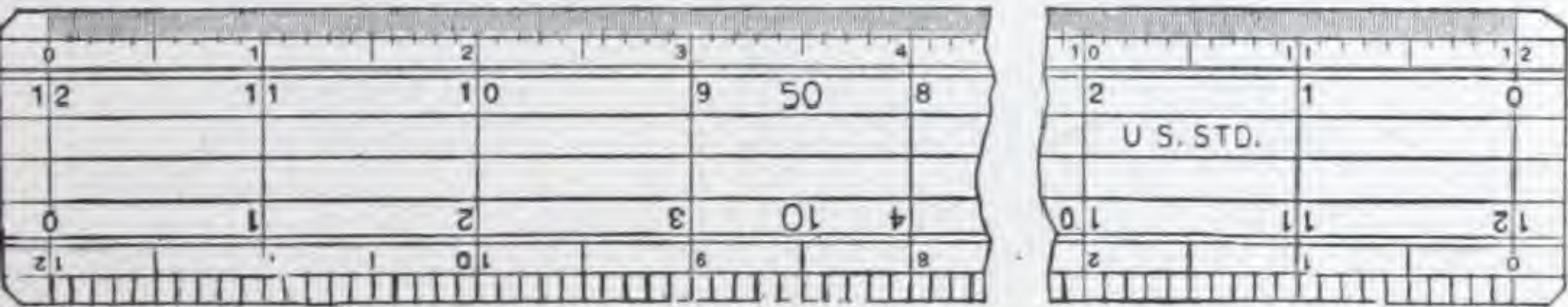
2602A

The form of these Scales makes them very convenient for many purposes. They are made of steel, nicked, with a dull finish; a 12-inch Scale weighs 2½ ounces. Each Scale has two graduations, one on each edge.

EACH

- 2602A Metal Scale, 12 inches, divided 1/8 x 1/4 inch to the foot.....
- 2602B Metal Scale, 12 inches, divided 1/4 x 1/2 inch to the foot.....
- 2602C Metal Scale, 12 inches, divided 3/8 x 3/16 inch to the foot.....
- 2602D Metal Scale, 12 inches, divided 1/2 x 1 inch to the foot.....
- 2602E Metal Scale, 12 inches, divided 3/4 x 1 1/2 inch to the foot.....
- 2602F Metal Scale, 12 inches, divided 1 1/2 x 3 inch to the foot.....

UNDERWRITER'S SCALE



2604A

EACH

- 2604A Flat Transparent Amber Underwriter's Scale, 6 inches, both edges beveled and divided 10 x 50 parts to the inch.....
- 2604B Flat Underwriter's Scale like No. 2604A, but 12 inches.....



## TRANSPARENT AMBER TRIANGLES



2640



2641

**2640** Transparent Amber Triangles, open center,  $45 \times 45^\circ$ .

Inches... 4 5 6 7 8 9 10 12 14 16 18

Each....

**2641** Transparent Amber Triangles, open center,  $30 \times 60^\circ$ .

Inches... 4 5 6 7 8 9 10 12 14 16 18

Each....

## WITH BEVELS ON INNER EDGES



2644-2646



2645-2647

**2644** Transparent Amber Triangles, open center,  $45 \times 45^\circ$ , with finger holds.

Inches... 4 5 6 7 8 9 10 12 14 16 18

Each....

**2645** Transparent Amber Triangles, open center,  $30 \times 60^\circ$ , with finger holds.

Inches... 4 5 6 7 8 9 10 12 14 16 18

Each....

**2646** Transparent Amber Triangles,  $45 \times 45^\circ$ ,  $\frac{3}{16}$  inch thick, with finger holds.

Inches..... 10 11 12 13 14 15 16 17 18

Each.....

**2647** Transparent Amber Triangles,  $30 \times 60^\circ$ ,  $\frac{3}{16}$  inch thick, with finger holds.

Inches..... 10 11 12 13 14 15 16 17 18

Each.....



## TRANSPARENT AMBER TRIANGLES—Continued.



2650



2651

2650 Transparent Amber Triangles,  $22\frac{1}{2}^\circ \times 67\frac{1}{2}^\circ$ ,  $\frac{1}{16}$  inch thick.

Size, inches..... 4      6      8      10      12      14      16

Each.....

2651 Transparent Amber Triangles,  $22\frac{1}{2}^\circ \times 67\frac{1}{2}^\circ$ ,  $\frac{1}{16}$  inch thick, with finger holds.

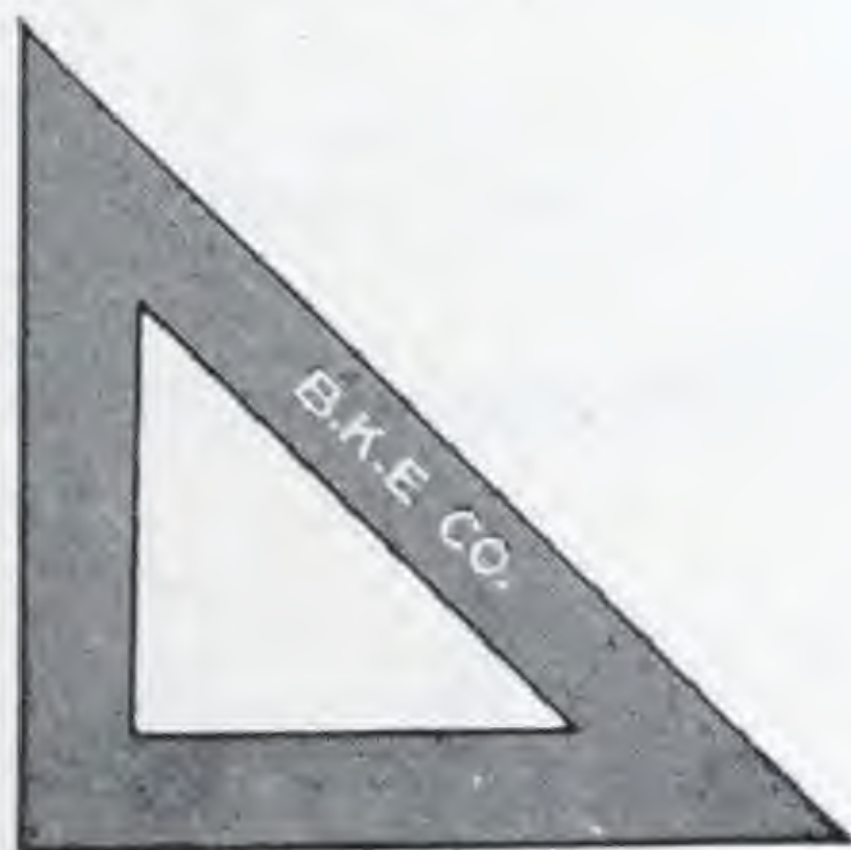
Size, inches..... 4      6      8      10      12      14      16

Each.....

## STEEL TRIANGLES



2653



2654

2653 Steel Triangles, nickel-plated,  $30^\circ \times 60^\circ$ .

Size, inches..... 6      7      8       $10\frac{1}{2}$       15

Each.....

2654 Steel Triangles, nickel-plated,  $45^\circ$ .

Size, inches..... 5       $6\frac{1}{2}$       8      10      12

Each.....



## LETTERING ANGLES, ROOF PITCHES, ETC.



2655

PER SET

- 2655 Transparent Amber Lettering Angles, 3 in a set.....

## LETTERING TRIANGLES



2656

PER SET

- 2656 Black Amber Lettering Angles, 3½ inches, three in set.....

- 2657 Transparent Amber Lettering Angles, 3½ inches, three in set.....

## TRIANGLES FOR ROOF PITCHES AND EMBANKMENTS



2659

PER SET

- 2659 Amber Triangles for Roof Pitches, six in set.....

- 2660 Amber Triangles for Embankments, eight slopes, six templets.....



ELLIPSES, HYPERBOLAS AND PARABOLAS



BLACK TRANSPARENT  
AMBER AMBER

- 2665 Hyperbolas, eight to set, 2 to 5½ inches.....
- 2666 Ellipses, six to set, 2 to 4½ inches.....
- 2667 Ellipses, ten to set, 1½ to 6 inches.....
- 2668 Parabolas, eight to set, 1¼ to 5½ inches.....
- 2669 Parabolas, eight to set, 3¼ to 14¼ inches.....

ADJUSTABLE CURVE RULERS



2670

EACH

- 2670 Adjustable Curve Ruler, 14½ inches long.....



2671

EACH

- 2671 Adjustable Curve Ruler, 30 inches long.....



2675

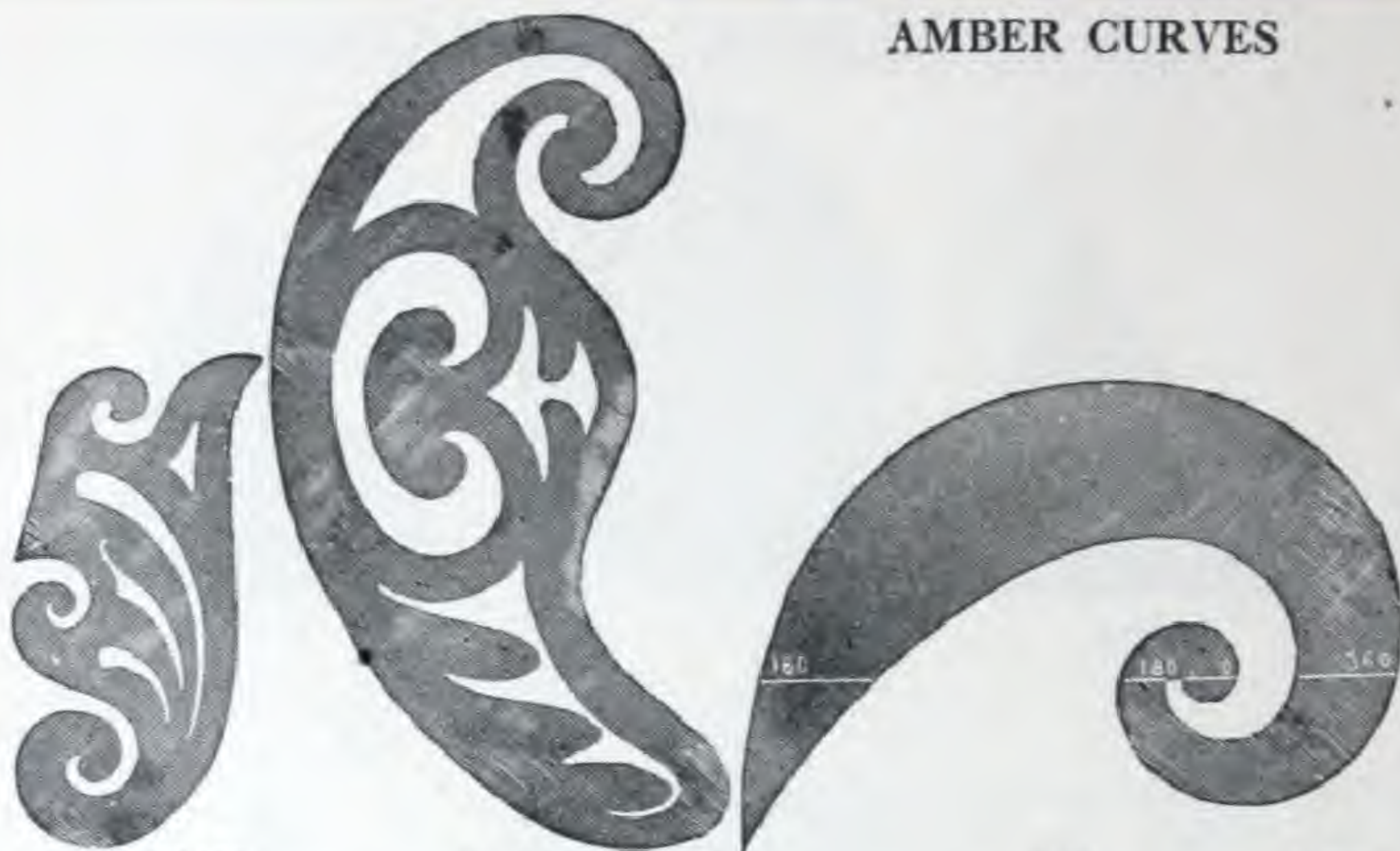
EACH

- 2674 Adjustable Curve Ruler, 7 inches long.....
- 2675 Adjustable Curve Ruler, 15 inches long.....
- 2676 Adjustable Curve Ruler, 31 inches long.....

The above rules are flexible, and any curve can be described and retained as the user may desire.



## AMBER CURVES



2677-2678	2679	2681	EACH
2677	Combination Curve of black amber.....		
2678	Combination Curve of transparent amber.....		
2679	Combination Curve of transparent amber.....		
2680	Logarithmic Spiral Curve of black amber.....		
2681	Logarithmic Spiral Curve of transparent amber.....		

Curves Nos. 2680 and 2681 are mathematically correct. All curves, within their size, can be made.

## THE "EARLY" LINEOGRAPH



2682

An ingenious invention, combining in one instrument necessary drawing tools needed by every student, viz.: 45 degrees, 30/60 degrees Triangles, French Curve, Protractor, Section Liner, Scale. Made of transparent celluloid, in three sizes.

2682	Sizes, inches, long edge.....	8	11	15
	Price, each.....			



[illegible]



## COPENHAGEN SHIP CURVES



2715-2717

EACH

- 2715 Of wood, per set of above 45 Curves, in case.....  
 2716 Of black amber, per set of above 45 Curves, in case.....  
 2717 Of transparent amber, per set of above 45 Curves, in case.....

For price on Single Curves, see page 153.



## COPENHAGEN SHIP CURVES—Continued.

## OF WOOD, BLACK AMBER AND TRANSPARENT AMBER

	Nos.	1	2	3	4	5	6	7	8	9	10
2715	Pearwood Curves										
2716	Blk. Am. Curves.										
2717	Trans. Am. Curves										

	Nos.	11	12	13	14	15	16	17	18	19	20
2715	Pearwood Curves.....										
2716	Black Amber Curves.....										
2717	Transparent Amber Curves.										

	Nos.	21	22	23	24	25	26	27	28	29	30
2715	Pearwood Curves.....										
2716	Black Amber Curves.....										
2717	Transparent Amber Curves.										

	Nos.	31	32	33	34	35	36	37	38	39	40
2715	Pearwood Curves.....										
2716	Black Amber Curves.....										
2717	Transparent Amber Curves.										

	Nos.	41	42	43	44	45
2715	Pearwood Curves.....					
2716	Black Amber Curves.....					
2717	Transparent Amber Curves.					

## CURVES FOR MECHANICAL ENGINEERS

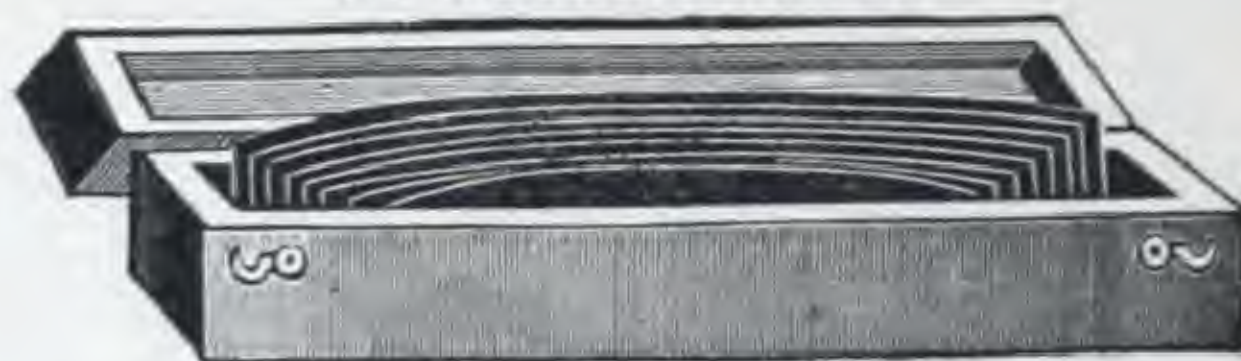
2717½ Transparent Amber Curves for mechanical and civil engineers.  
Per set of ten, consisting of No. 2717 Curves, Nos. 13, 16, 27,  
31, 34, 35, 41, 42, 43 and 44. In polished wooden box.....

PER SET

2716½ Same as No. 2717½, in black amber.....



### RAILROAD CURVES IN WOODEN BOXES



- 2692  
BLACK AMBER**
- PER SET
- 2689 One set of 10 Curves, viz.: 12, 25, 36, 48, 60, 72, 84, 96, 108, 120 inches radius. . . . .
- 2690 One set of 17 Curves, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches radius. . . . .
- 2691 One set of 24 Curves, viz.: 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24 inches radius. . . . .
- 2692 One set of 43 Curves, viz.: 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 42, 48, 54, 60, 66, 72, 78, 84, 90, 100, 110, 120, 130, 140, 160, 180, 200 inches radius. . . . .
- 2693 One set of 46 Curves, viz.: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 27, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200 inches radius. . . . .
- 2694 One set of 100 Curves, varying ½ inch from 2 inches to 3½ inches; and 1 inch from 4 inches to 100 inches. . . . .
- EACH
- 2694S Single Railroad Curves of black amber. . . . .
- PEARWOOD**
- PER SET
- 2695 One set of 10 Curves, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches radius. . . . .
- 2696 One set of 17 Curves, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches radius. . . . .
- 2697 One set of 24 Curves, viz.: 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24 inches radius. . . . .
- 2698 One set of 43 Curves, viz.: 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 42, 48, 54, 60, 66, 72, 78, 84, 90, 100, 110, 120, 130, 140, 160, 180, 200 inches radius. . . . .
- 2699 One set of 46 Curves, viz.: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 27, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200 inches radius. . . . .
- 2700 One set of 100 Curves, varying ½ inch from 2 inches to 3½ inches; and 1 inch from 4 inches to 100 inches. . . . .

See next page for Metal and Cardboard Curves

See second page for Transparent Amber R. R. Curves



## RAILROAD CURVES—Continued.

## CARDBOARD RAILROAD CURVES

PER SET

- 2701** Cardboard Railroad Curves, 30 in set, viz.:  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$ , 3,  $3\frac{1}{2}$ , 4,  $4\frac{1}{2}$ , 5,  $5\frac{1}{2}$ , 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 35, 40, 45, 50, 60 inches radius, in wooden box. ....
- 2702** Cardboard Railroad Curves, 50 in set, viz.:  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$ , 3,  $3\frac{1}{2}$ , 4,  $4\frac{1}{2}$ , 5,  $5\frac{1}{2}$ , 6,  $6\frac{1}{2}$ , 7,  $7\frac{1}{2}$ , 8,  $8\frac{1}{2}$ , 9,  $9\frac{1}{2}$ , 10,  $10\frac{1}{2}$ , 11,  $11\frac{1}{2}$ , 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120 inches radius, in wooden box
- 2703** Cardboard Railroad Curves, 100 in set, viz.:  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$ , 3,  $3\frac{1}{2}$ , 4,  $4\frac{1}{2}$ , 5,  $5\frac{1}{2}$ , 6,  $6\frac{1}{2}$ , 7,  $7\frac{1}{2}$ , 8,  $8\frac{1}{2}$ , 9,  $9\frac{1}{2}$ , 10,  $10\frac{1}{2}$ , 11,  $11\frac{1}{2}$ , 12,  $12\frac{1}{2}$ , 13,  $13\frac{1}{2}$ , 14,  $14\frac{1}{2}$ , 15,  $15\frac{1}{2}$ , 16,  $16\frac{1}{2}$ , 17,  $17\frac{1}{2}$ , 18,  $18\frac{1}{2}$ , 19,  $19\frac{1}{2}$ , 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 180, 200, 220, 240 inches radius, in wooden box. ....

## METAL RAILROAD CURVES



2704-2707

PER SET

- 2704** Metal Railroad Curves, 10 in set, 12 to 120 inches radius, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches, in wooden box. ....
- 2705** Metal Railroad Curves, 17 in set, 12 to 60 inches radius, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches, in wooden box. ....
- 2706** Metal Railroad Curves, 94 in set, marked in degrees and inches to 100 foot scale, as follows: Every 5 minutes from 15 minutes to 1 degree, every 10 minutes from 1 degree to 5 degrees, every 15 minutes from 5 degrees to 15 degrees, every 30 minutes from 15 degrees to 20 degrees, every degree from 20 degrees to 30 degrees. These are not made with tangent. ....

EACH

- 2707** Single Railroad Curves of metal. ....  
See next page for Transparent Amber R. R. Curves



## RAILROAD CURVES—Continued.

## TRANSPARENT AMBER RAILROAD CURVES



2711

PER SET

2708 Transparent Amber Railroad Curves, 10 in set, 12 to 120-inch radius, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches, in wooden box.

2709 Transparent Amber Railroad Curves, 17 in set, 12 to 60-inch radius, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches, in wooden box.

2710 Transparent Amber Railroad Curves, 24 in set, 2 to 24-inch radius, viz.: 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24 inches, in wooden box with partition.

2711 Transparent Amber Railroad Curves, with Tangent, 41 in set, marked in degrees and inches to 100 feet scale, viz.:

0°.30' = 114.59 in.	3°.30' = 16.37 in.	6°.00' = 9.55 in.	8°.30' = 6.75 in.
1°.00' = 57.30 in.	3°.45' = 15.28 in.	6°.15' = 9.17 in.	8°.45' = 6.55 in.
1°.15' = 45.84 in.	4°.00' = 14.33 in.	6°.30' = 8.82 in.	9°.00' = 6.37 in.
1°.30' = 38.20 in.	4°.15' = 13.48 in.	6°.45' = 8.49 in.	9°.15' = 6.20 in.
1°.45' = 32.74 in.	4°.30' = 12.73 in.	7°.00' = 8.19 in.	9°.30' = 6.04 in.
2°.00' = 28.65 in.	4°.45' = 12.07 in.	7°.15' = 7.91 in.	9°.45' = 5.88 in.
2°.15' = 25.47 in.	5°.00' = 11.46 in.	7°.30' = 7.64 in.	10°.00' = 5.74 in.
2°.30' = 22.92 in.	5°.15' = 10.92 in.	7°.45' = 7.40 in.	10°.30' = 5.48 in.
2°.45' = 20.84 in.	5°.30' = 10.42 in.	8°.00' = 7.17 in.	11°.00' = 5.22 in.
3°.00' = 19.10 in.	5°.45' = 9.97 in.	8°.15' = 6.95 in.	11°.30' = 4.99 in.
3°.15' = 17.63 in.	In wooden box with partition, per set.		

2712 Transparent Amber Railroad Curves, with Tangent, 55 in set, marked in degrees and inches to 100 feet scale, viz.:

0°.15' = 229.18 in.	3°.45' = 15.28 in.	7°.15' = 7.91 in.	11°.30' = 4.99 in.
0°.30' = 114.59 in.	4°.00' = 14.33 in.	7°.30' = 7.64 in.	12°.00' = 4.78 in.
0°.45' = 76.39 in.	4°.15' = 13.48 in.	7°.45' = 7.40 in.	12°.30' = 4.59 in.
1°.00' = 57.30 in.	4°.30' = 12.73 in.	8°.00' = 7.17 in.	13°.00' = 4.42 in.
1°.15' = 45.84 in.	4°.45' = 12.07 in.	8°.15' = 6.95 in.	13°.30' = 4.25 in.
1°.30' = 38.20 in.	5°.00' = 11.46 in.	8°.30' = 6.75 in.	14°.00' = 4.10 in.
1°.45' = 32.74 in.	5°.15' = 10.92 in.	8°.45' = 6.55 in.	14°.30' = 3.96 in.
2°.00' = 28.65 in.	5°.30' = 10.42 in.	9°.00' = 6.37 in.	15°.00' = 3.83 in.
2°.15' = 25.47 in.	5°.45' = 9.97 in.	9°.15' = 6.20 in.	16°.00' = 3.59 in.
2°.30' = 22.92 in.	6°.00' = 9.55 in.	9°.30' = 6.04 in.	17°.00' = 3.38 in.
2°.45' = 20.84 in.	6°.15' = 9.17 in.	9°.45' = 5.88 in.	18°.00' = 3.20 in.
3°.00' = 19.10 in.	6°.30' = 8.82 in.	10°.00' = 5.74 in.	19°.00' = 3.03 in.
3°.15' = 17.63 in.	6°.45' = 8.49 in.	10°.30' = 5.48 in.	20°.00' = 2.88 in.
3°.30' = 16.37 in.	7°.00' = 8.19 in.	11°.00' = 5.22 in.	

In wooden box with partition, per set.

EACH

2708S Single Railroad Curves of transparent amber.

2711S Single Railroad Curves of transparent amber, with tangent.



## SPLINES



2718-2720

Size, inches. . . 24 30 36 42 48 60

- 718 Pearwood Splines,  
 719 Black Amber Splines,  
 720 Transparent Amber Splines,

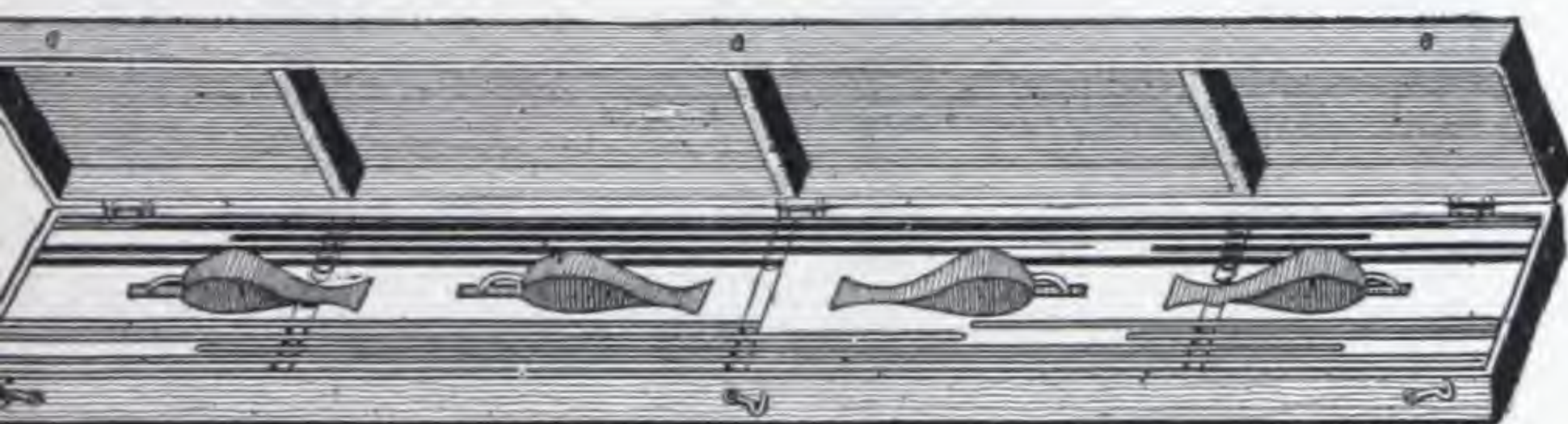
## WEIGHTS FOR SPLINES



2721

EACH

- 721 Weights for Splines, with finger, about  $3\frac{1}{2}$  pounds.....  
 722 Weights for Splines, with finger, about 8 pounds.....

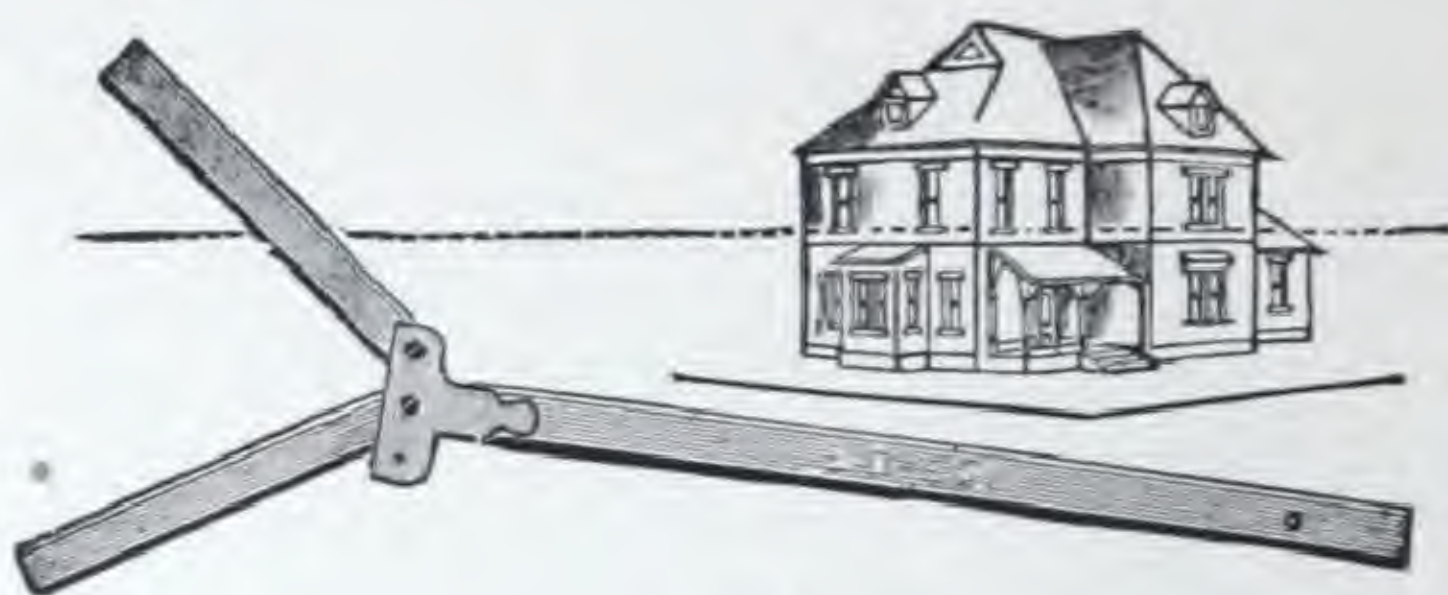


2723

- 723 Set of Splines and Spline Weights, containing:  
 4 Spline Weights, No. 2721.  
 1 each Pearwood Splines, No. 2718, 12, 18, 24, 30, 36, 48 inches.  
 1 each Black Amber Splines, No. 2719, 12, 18, 24, 30, 36, 42 inches.  
 PER SET  
 In strong wooden box.....



## PERSPECTIVE LINEADS



2724

EACH

- 2724 Perspective Linead, mahogany, ebony lined, nickel plated swivels, with two studs, blade 24 inches, arms 10 inches.....
- 2725 Same as No. 2724, with blade 30 inches, arms 11 inches.....
- 2726 Same as No. 2724, with blade 36 inches, arms 12 inches.....

## BARS FOR BEAM COMPASSES



Style No. 1



Style No. 2



Style No. 3

2728

- 2728 Bars for Beam Compasses made of hardwood, Style Nos. 1, 2, or 3.
- |                   |    |    |    |    |    |    |
|-------------------|----|----|----|----|----|----|
| Size, inches..... | 24 | 30 | 36 | 42 | 48 | 60 |
| Each.....         |    |    |    |    |    |    |

These Bars are made with a lip on one side at bottom to prevent Beam Compass from dropping off Bar when loosened.



# WOODEN T SQUARES

All the T Squares listed in this catalogue are guaranteed to be of best workmanship, and only thoroughly seasoned material is used in their manufacture.



2730

2730 Cherry Wood, with fixed head.

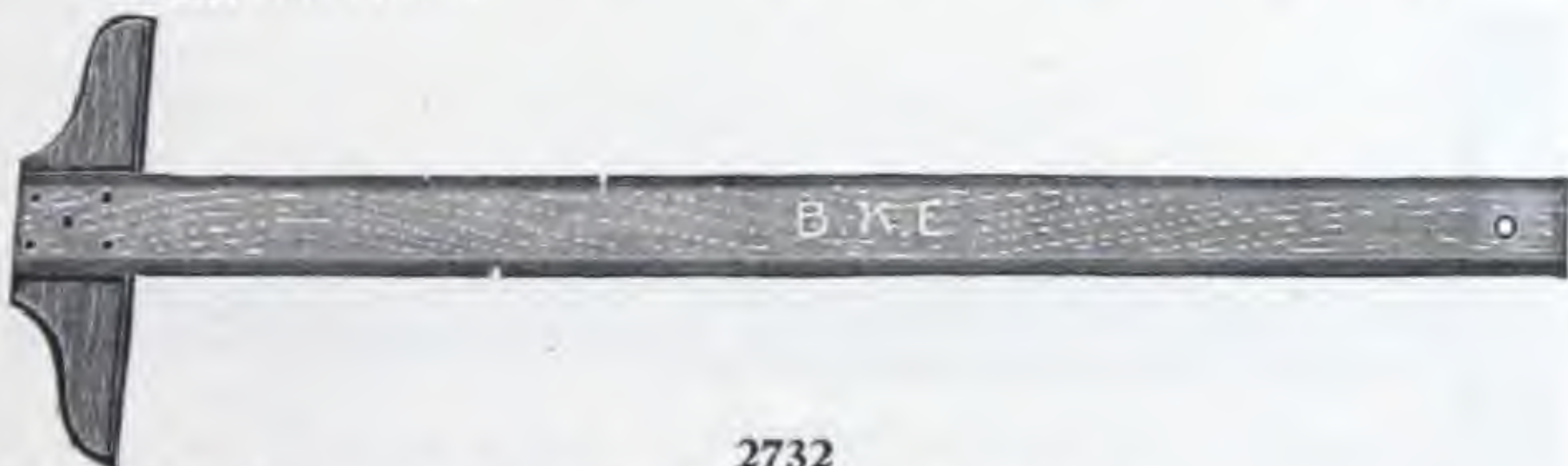
Size, inches.....	15	18	24	30	36	42	48
Each.....							



2730A

2730A Cherry Wood, plain blade, shifting head and swivel.

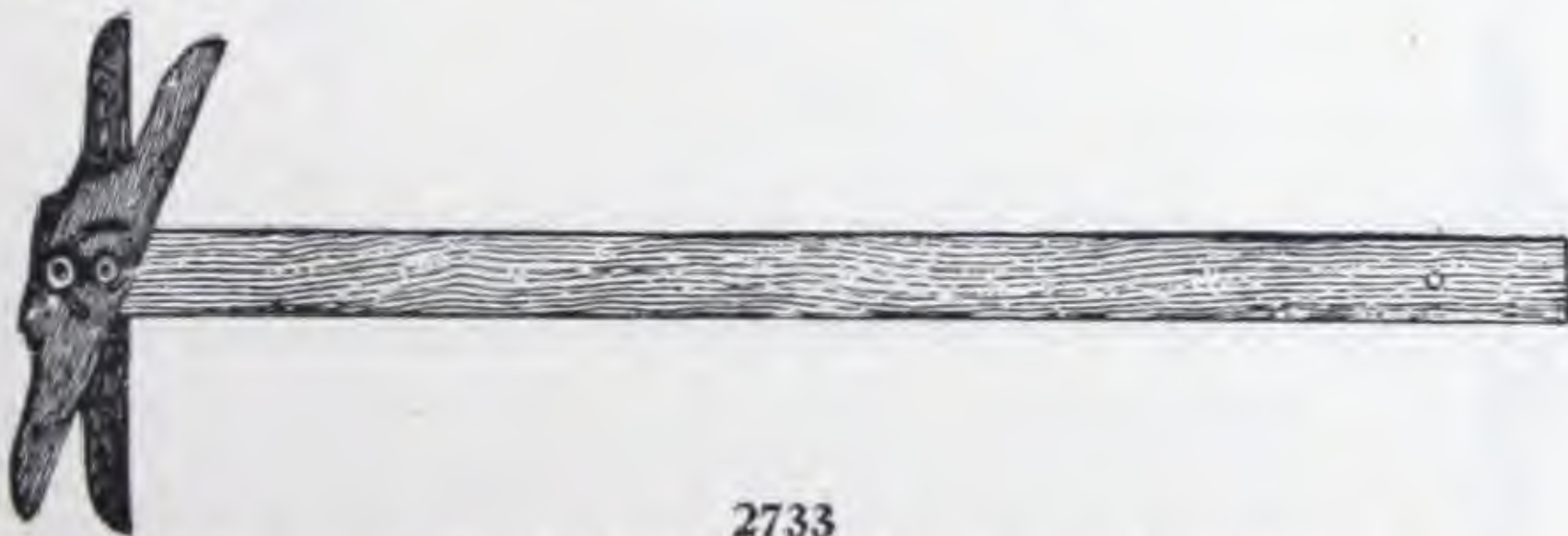
Size, inches.....	15	18	24	30	36	42	48
Each.....							



2732

2732 Ash Blade, maple lined, black walnut, fixed head.

Size, inches..	24	30	36	42	48	54	60	72
Each.....								



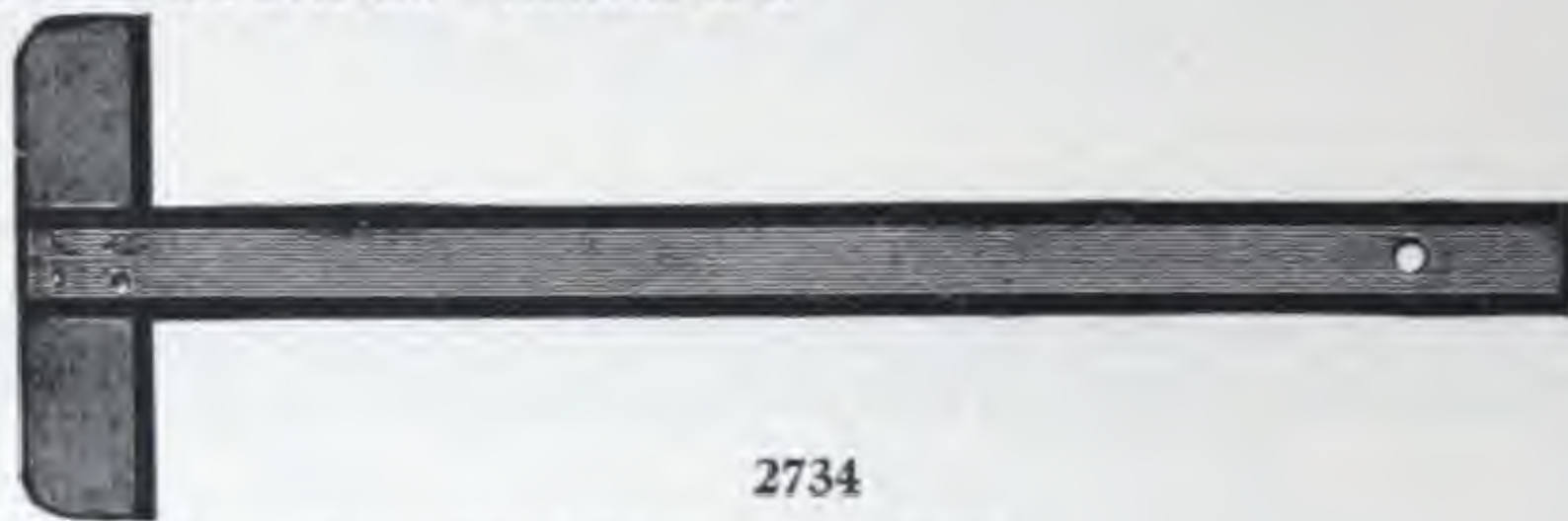
2733

2733 Ash Blade, maple lined, shifting black walnut, double head.

Size, inches..	24	30	36	42	48	54	60	72
Each.....								



## WOODEN T SQUARES—Continued.



2734

2734 Mahogany, ebony lined blade, fixed head.

Size, inches.. 24 30 36 42 48 54 60 72  
 Each.....



2735

2735 Mahogany, ebony lined, shifting mahogany, double head.

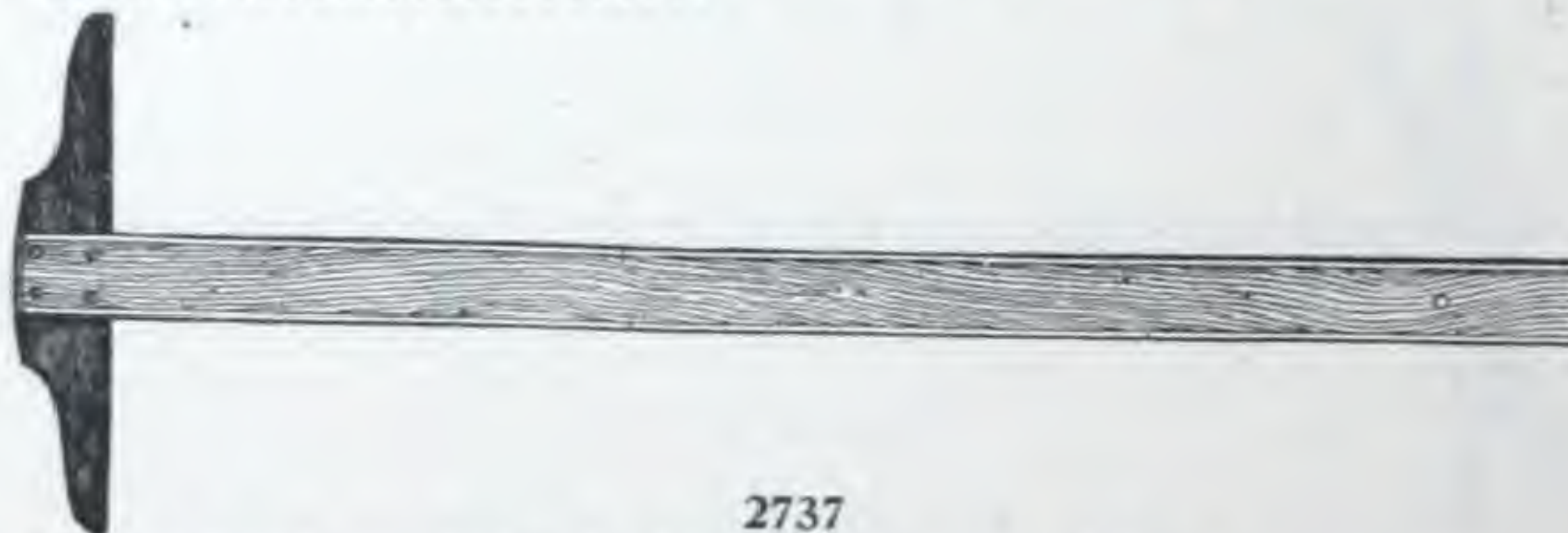
Size, inches.. 24 30 36 42 48 54 60  
 Each.....



2736

2736 Mahogany blade, tapered, ebony lined, fixed head.

Size, inches..... 30 36 42 48 54  
 Each.....



2737

2737 Amber lined, maple blade, black walnut, fixed head.

Size, inches..... 24 30 36 42 48 54 60  
 Each.....



## WOODEN T SQUARES—Continued.



2738

- 2738 Amber lined, maple blade, black walnut movable head.  
 Size, inches..... 24 30 36 42 48 54 60  
 Each.....



2739

- 2739 Mahogany blade, ebony lined, fixed head, with nickel micrometer adjustment.  
 Size, inches..... 24 30 36 42 48 54 60  
 Each.....

## STEEL T SQUARES



2740

The heads of these T Squares are made of aluminum, weighing only from 4 to 6 ounces. The heads are 10 inches long. The blades are made of spring-tempered steel, all nicely finished and warranted accurate.

EACH

- 2740 Steel T Square, blade 24 x 1 inch, 3-64 inch thick.....  
 2741 Steel T Square, blade 36 x 1 1/4 inches, 3-64 inch thick.....  
 2742 Steel T Square, blade 48 x 1 1/4 inches, 3-64 inch thick.....



## STRAIGHT EDGES

B.K.E. CO.

## 2750

2750 Cherry, one edge beveled.

Size, inches. . . . . 18 24 30 36 42

Each. . . . .

B.K.E. CO.

## 2751

2751 Ash, hardwood lined, one edge beveled.

Size, inches. . . . . 24 30 36 42 48 54 60 72

Each. . . . .

B.K.E. CO.

## 2752

2752 Mahogany, ebony lined, one edge beveled.

Size, inches. . . . . 24 30 36 42 48 54

Each. . . . .

B.K.E. CO.

## 2753

2753 Transparent amber lined, square edges.

Size, inches. . . . . 18 24 30 36 42 48

Each. . . . .

B.K.E. CO.

## 2754

2754 Steel Straightedges, nickel-plated, one edge beveled.

Size, ins. 15 18 24 30 36 42 48 60 72

Each. . . . .

B.K.E. CO.

## 2755

2755 Steel Straightedges, nickel-plated, square edges.

Size, ins. 15 18 24 30 36 42 48 60 72

Each. . . . .



## DRAWING BOARDS

Made from Selected and Well Seasoned Pine and of Best Workmanship



2760

- 760 Drawing Board, pinewood,  $\frac{7}{8}$  inch thick, with two drawing surfaces and end ledges.

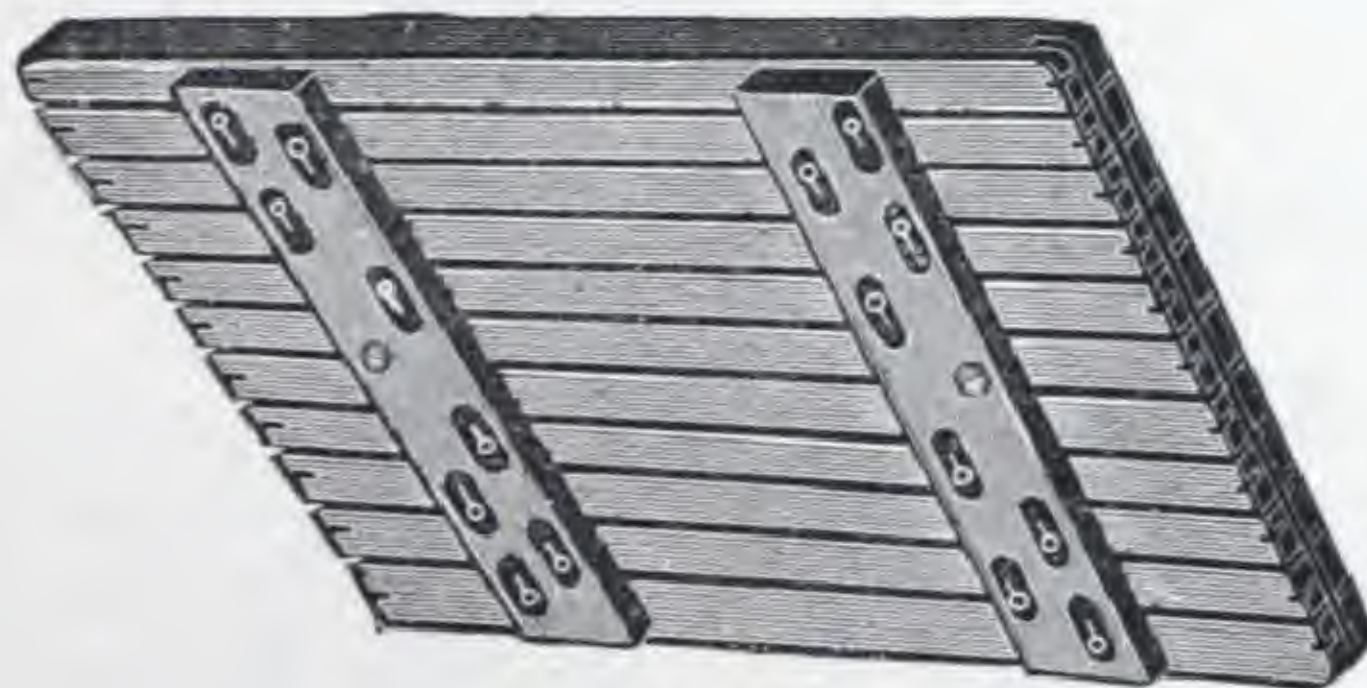
Size, inches..... 16 x 21 18 x 24 19 x 25 20 x 26 23 x 31 31 x 42  
Each.....



2762

- 762 Drawing Board, pinewood,  $\frac{7}{8}$  inch thick, with hardwood cleats secured by screws running in slotted washers.

Size, inches..... 23 x 31 31 x 42 33 x 55  
Each.....



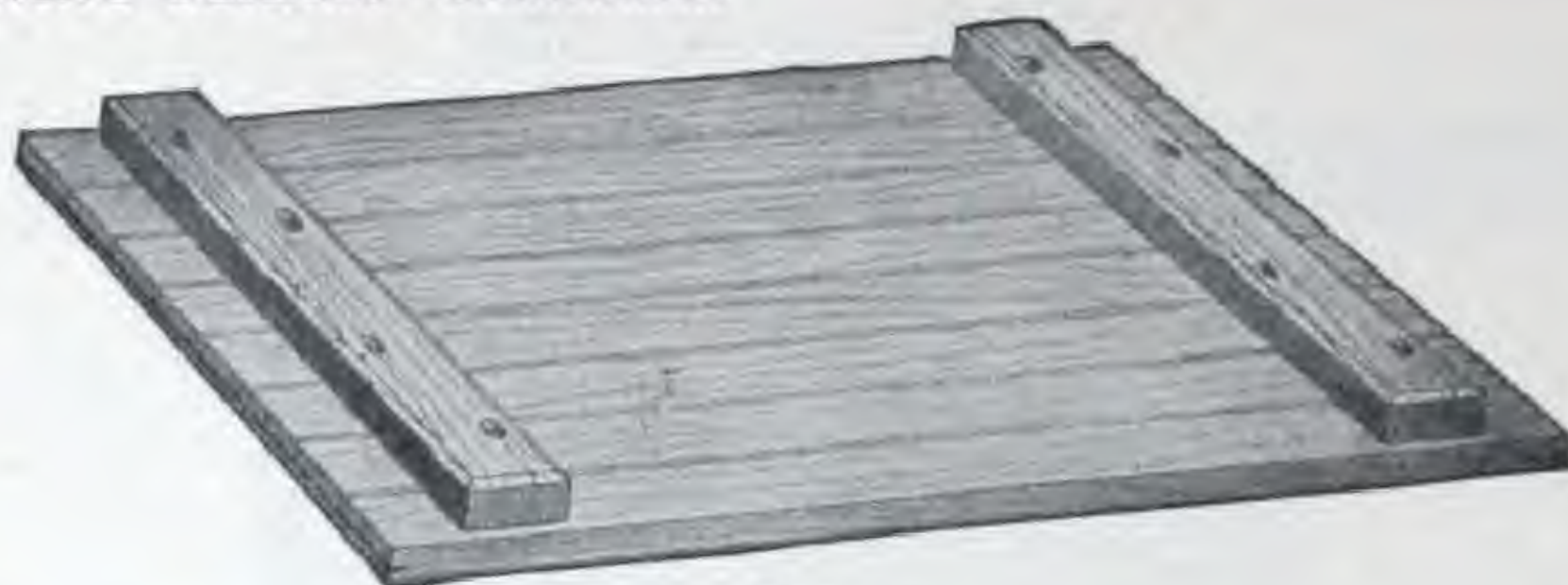
2764

- 764 Pinewood,  $\frac{7}{8}$  inch thick, hardwood cleats, grooves sunken in half thickness of the board to allow contraction, and having a slip of hardwood set into edge of board to allow an easy movement of the T square.

Size, inches..... 23 x 31 31 x 42 33 x 55  
Each.....



## DRAWING BOARDS—Continued.



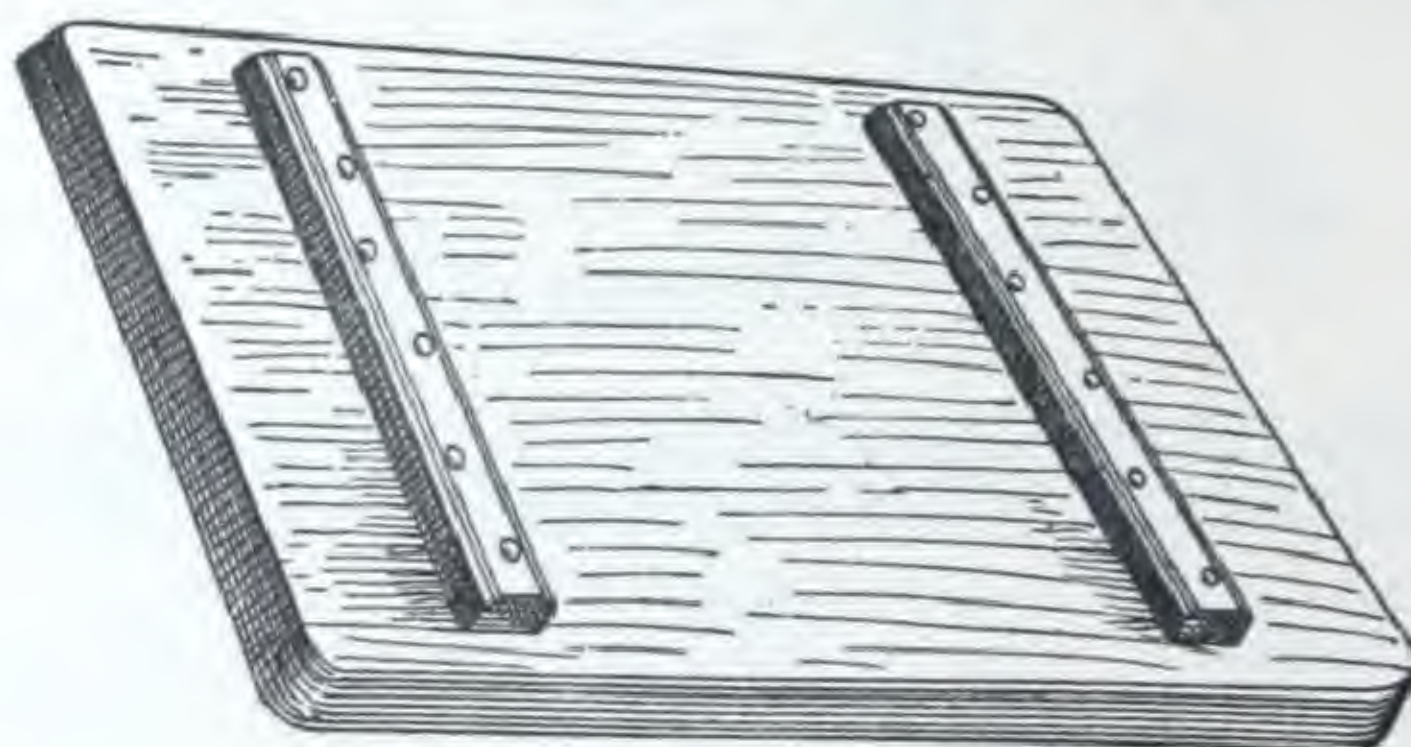
2765

**2765** Drawing board, basswood, with hardwood cleats on back, with slotted screws to guard against contraction and expansion. There is also a series of grooves cut in the back of the board to take the transverse strength out of the wood.

To insure a perfectly smooth working edge a strip of hardwood is fitted into the edge of the board, and the strip is sawed at intervals to allow for contraction.

Size, inches.....31 x 42    36 x 55    42 x 60    48 x 72  
Each.....

## DETAIL BOARDS OR TABLE TOPS



2766

**2766** Drawing or Detail Boards, best selected pine, with hardwood cleats, secured by screws running in slotted washers.

SIZE	EACH	SIZE	EACH
31 x 42 x $\frac{7}{8}$ inch.....		48 x 96 x $1\frac{1}{4}$ inches....	
36 x 48 x $\frac{7}{8}$ inch.....		48 x 120 x $1\frac{1}{2}$ inches....	
42 x 60 x $1\frac{1}{8}$ inches.....		54 x 120 x $1\frac{1}{2}$ inches....	
42 x 72 x $1\frac{1}{8}$ inches.....		54 x 144 x $1\frac{1}{2}$ inches....	
42 x 84 x $1\frac{1}{8}$ inches.....		60 x 120 x $1\frac{1}{2}$ inches....	
48 x 72 x $1\frac{1}{8}$ inches.....		60 x 144 x $1\frac{1}{2}$ inches....	
48 x 84 x $1\frac{1}{4}$ inches.....			

Sizes up to 48 x 120 inches are carried in stock.

For Trestles for Boards see page 165



## TRESTLES FOR DRAWING BOARDS



2770

PER PAIR

- 2770 Pinewood Horses, 37 inches high, 38 inches long.....
- 2771 Pinewood Horses, 37 inches high, 38 inches long, with sloping top ledges.....
- 2772 Adjustable Pinewood Horses, adjustable to any slope, or can be used level. Height adjustments from 37 to 47 inches. Length of Horses 38 inches.....



2772



# "LIBERTY" DRAWING TABLE



2790

The "Liberty" Drawing Table is, without question, the best all-wood drawing table on the market, at a price within the reach of everyone. It has a good pine top and is neatly finished with shellac. It has the tilting device and vertical adjustment.

EACH

- |       |  |
|-------|--|
| 2790  | Liberty Table, top 31 x 42 inches..... |
| 2790A | Liberty Table, top 37 x 48 inches..... |
| 2790B | Liberty Table, top 37 x 60 inches..... |
| 2790C | Liberty Table, top 43 x 60 inches..... |



## OAKLAND AND ROANOKE DRAWING TABLES



2791B

2791A Showing Tool Cabinet

This is a very convenient Drawing Table, and is strong, durable and very rigid. Suitable for all kinds of drawing or for schools. It is made of hardwood; the standards are slotted and the cross bar has a tenon on each end which runs in the slots of the standards. The cross bar has a hole running through the center and a rod running clear through which holds the legs on, and when the rod is turned up it holds the table very firm and allows no vibration.

EACH

- 2791 Oakland Table, top, 22 x 30 inches. ....  
 2791A Oakland Table, top, 24 x 32 inches. ....  
 2791B Oakland Table, top, 32 x 42 inches. ....  
 2791C Oakland Table, top, 37 x 48 inches. ....  
 2791D Tool Cabinet for Oakland Table. ....



2792A

The Roanoke Drawing Table has a frame of hardwood with iron legs. It can be raised and lowered from 32 to 40 inches. The raising, lowering and tilting is done by means of hand wheels on the right side, and when tightened, the table is very rigid; this feature being accomplished by rods running through each cross bar. The Roanoke Table has a soft wood top, of the same style and construction as on our very best drawing tables. Price List on next page.



## ROANOKE DRAWING TABLE—Continued.

		EACH
2792	Roanoke Table, top, 32 x 42 inches.....	
2792A	Roanoke Table, top, 37 x 48 inches.....	
2792B	Roanoke Table, top, 37 x 60 inches.....	
2792C	Roanoke Table, top, 40 x 72 inches.....	
	Extras for the Roanoke Table:	
2792R	Foot Rest.....	
2792S	Swing Tray.....	
2792T	Swing Drawer and Tray.....	

See bottom of page 167 for description

### COMBINATION DRAWING AND REFERENCE TABLE AND FILING CABINET



2793

This table is designed to meet the requirements of those who desire a drawing table occasionally for library or office use. As shown in illustration, it is readily converted into a drawing table by simply pulling out the drawers, which exposes a drawing board set in the top of the drawer, the rear edge of which you lift out and set on the table top. A small side tray holds your tools, which, together with drawing paper, etc., are also kept in the drawer. The drawer is supported by extension slides to prevent sagging.

The table is made from thoroughly kiln-dried oak, with regular finish golden oak, rubbed and polished. The drawing board is of select soft wood, nicely made. Size of table top, 35 x 47 inches; drawing board, 31 x 42 inches.

2793	Table, including tray and board.....	EACH
------	--------------------------------------	------

An Extra charge is made if special finish is ordered.



# "EMPIRE" DRAWING TABLES



2796B

The Empire Drawing Tables are made of cast iron, of rigid and durable construction and nicely japanned. The top is raised and lowered by rack and pinion, and can be tilted and clamped at any angle desired. The top consists of our best pinewood drawing board.

EACH

2796	Empire Table, with top, 31 x 42 inches. ....
2796B	Empire Table, with top, 37 x 48 inches. ....
2796C	Empire Table, with top, 37 x 60 inches. ....
2796D	Empire Table, with top, 43 x 60 inches. ....
2796E	Empire Table, with top, 43 x 72 inches. ....



## ELLIOTT METAL DRAFTING TABLE



The Elliott metal drafting table is the most comfortable iron stand table on the market. This is due to the unusual range of adjustment. Two hand-grips on the right control the adjustment, the upper giving any desired angle of inclination to the board, while the lower raises or lowers board to any height for standing or sitting positions. This is done without effort, as the weight of the board is counterbalanced by spiral springs. Bearings at the lock screws are conical, and when tightened are immovable. Top is of selected pine. Tables made either with or without swing cabinet. The cabinet is of quartered oak, handsomely finished, with lock and key.

Sold in three standard sizes, 31 x 42, 36 x 48 and 48 x 60 inches and larger sizes to order.

	EACH
2797A Elliott Table, without Cabinet, 31 x 42.....	
2797B Elliott Table, without Cabinet, 36 x 48.....	
2797C Elliott Table, without Cabinet, 48 x 60.....	
2797D Cabinet for Elliott Tables.....	



## "ACME" DRAWING TABLES

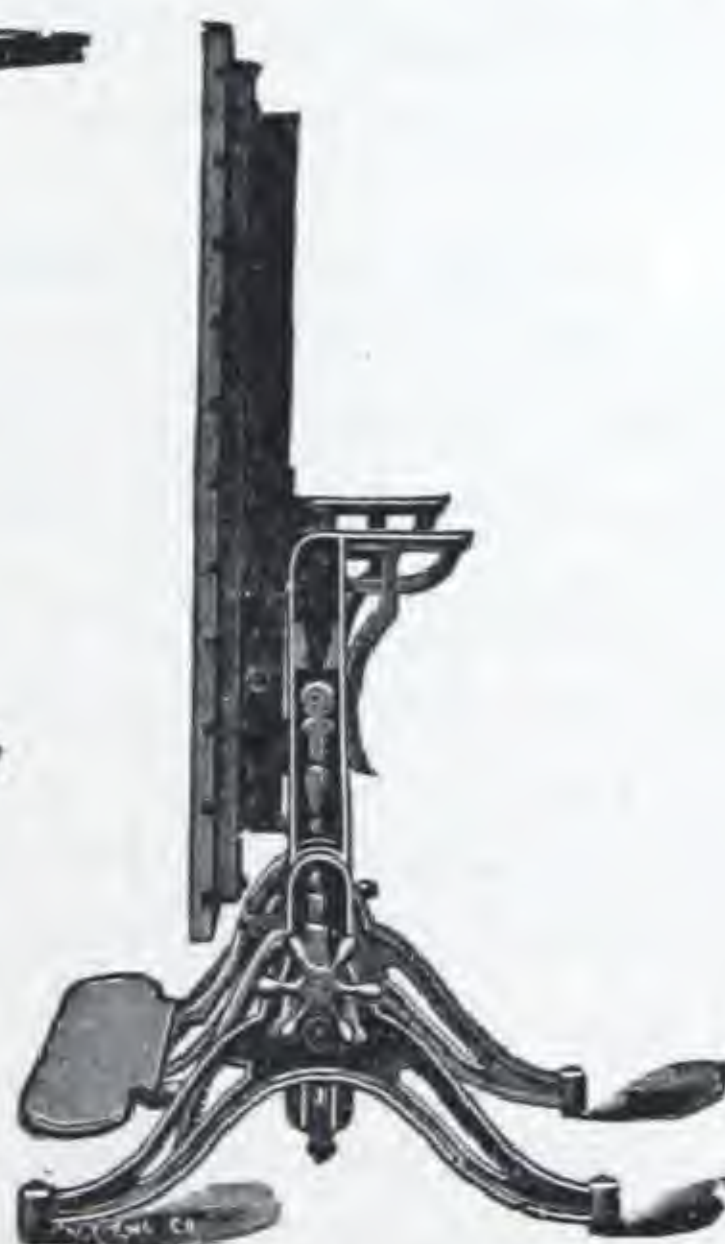


2799

2799 "Acme" Table, plain, without attachment.  
 Top, inches.....32 x 42      37 x 48      37 x 60      40 x 72  
 Each.....



2800



2800 Folded

2800 "Acme" Drawing Table, with foot rest, swing instrument drawer and sketch box. Table has adjustment for inclining to either side, and top can be raised without raising frame, as shown in cut. It can easily be folded and set to one side when not in use, which is a great convenience.

Top, inches.....32 x 42      37 x 48      37 x 60      40 x 72  
 Each.....



## ELLCO DRAWING TABLES AND FILING CABINETS

### SPECIFICATIONS

The main points of excellence that distinguish the Ellco Drafting Room Furniture are as follows:

**Selected Wood** used throughout the line, advanced methods of seasoning and glue jointing, the strength of every part guaranteed.

Scientific Structure including glue joints, tenons, distribution of weights, etc., that withstand great severity of transportations and climate in distant parts of the world.

**An Ellco piece of Furniture** is always in service and depreciates very little in money value. Drawer sides are dovetailed front and back, presenting neat cabinet work; drawer bottoms are three ply, which prevents sagging. Tops are fastened to a frame to allow the top to come and go according to change in temperature and moisture.

A rubbing strip with rounded edges runs along front of table and protects the clothes from edges of table top; a guard  $\frac{1}{4}$  inch high is at back of table top to prevent papers and pencils from falling off. The tables may be raised to 1, 2, 3 inches by raising blocks according to height desired.

**Materials.** Tops of all tables and the drawing boards are made of soft white pine glued up from strips three to five inches in width. Ends of table tops are fitted with hardwood straight edges set in grooves. All other exposed parts of table are plain oak, except legs and foot rails, which, because they receive very hard usage, must be made of a tough wood, therefore they are made of elm.

Exposed parts of filing cases are plain oak, except the backs which are merchantable soft wood plain beaded work. All friction pieces of tables and cases, such as drawer sides and bearers, are made of close grain hardwood; other unexposed parts of tables and filing cases are merchantable soft wood.

**Finish** is antique oak with three finishing coats, thoroughly rubbed down after each coat, thus producing a dull smooth finish. White Pine tops shellaced and sanded after coating. We can make any kind of special finish. Unless otherwise ordered, we finish all work in antique oak. Tables and filing cases will be constructed of any kind of wood if so ordered at additional cost.



## ALLCO DRAWING TABLES AND FILING CABINETS—Continued

**The Loose Inclined Drawing Board** is made  $\frac{7}{8}$  inch thick, with two dovetailed cross pieces to prevent warping. The board is inclined by turned raising blocks  $2\frac{1}{2}$  inches high.

**The Tool Tray and Frame.** The tray frame is  $7\frac{3}{4}$  x 18 inches, with four compartments for pencils, erasers, tools, etc., made to fit in the small drawers of any table, and makes a very useful addition.

**Sectional Filing Cases.** Our filing cases are constructed with the same care and class of work as the tables. The sections are held in position in all directions making a rigid case when set up in different sections.

**Holding Down Wires.** A device for protecting the drawings and holding them in place in the drawer at all times.

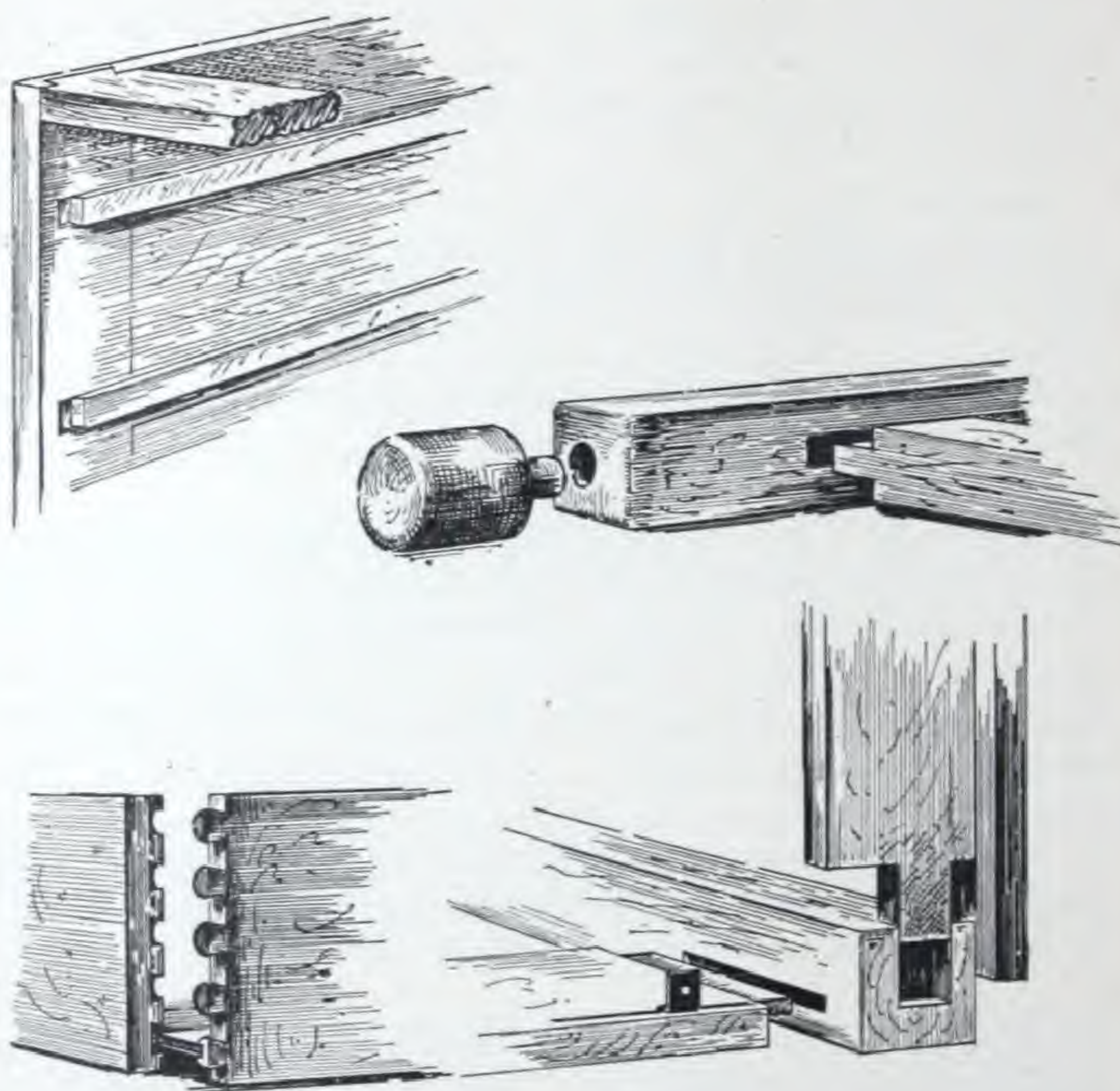
**Key Locks.** It is practicable to have one small drawer with lock, so the private tools and papers of the draftsman will be secure, two keys with each lock. If several tables are used in a drafting room the locks may be master keyed so that each table will have a private lock, and the chief draftsman may have one key which will unlock all drawers. One master key will be furnished with every eight locks.

**Reputation.** As we can not show the quality and finish of our goods by means of illustrations and descriptions, therefore we ask the buyer to rely upon the reputation and standing which our work has already gained.

Remember that we will be pleased to give estimates on Special Drafting Room Furniture of any description.



## ELLCO DRAWING TABLES AND FILING CABINETS—Continued

SOME OF THE CONSTRUCTURAL FEATURES  
OF ELLCO  
TABLES AND FILING CASES

A casual study of these few plans, in connection with explanation on preceding pages, will lend an insight into the superior value of the Ellco Drafting Room Furniture.



## LLCO DRAWING TABLES AND FILING CABINETS—Continued

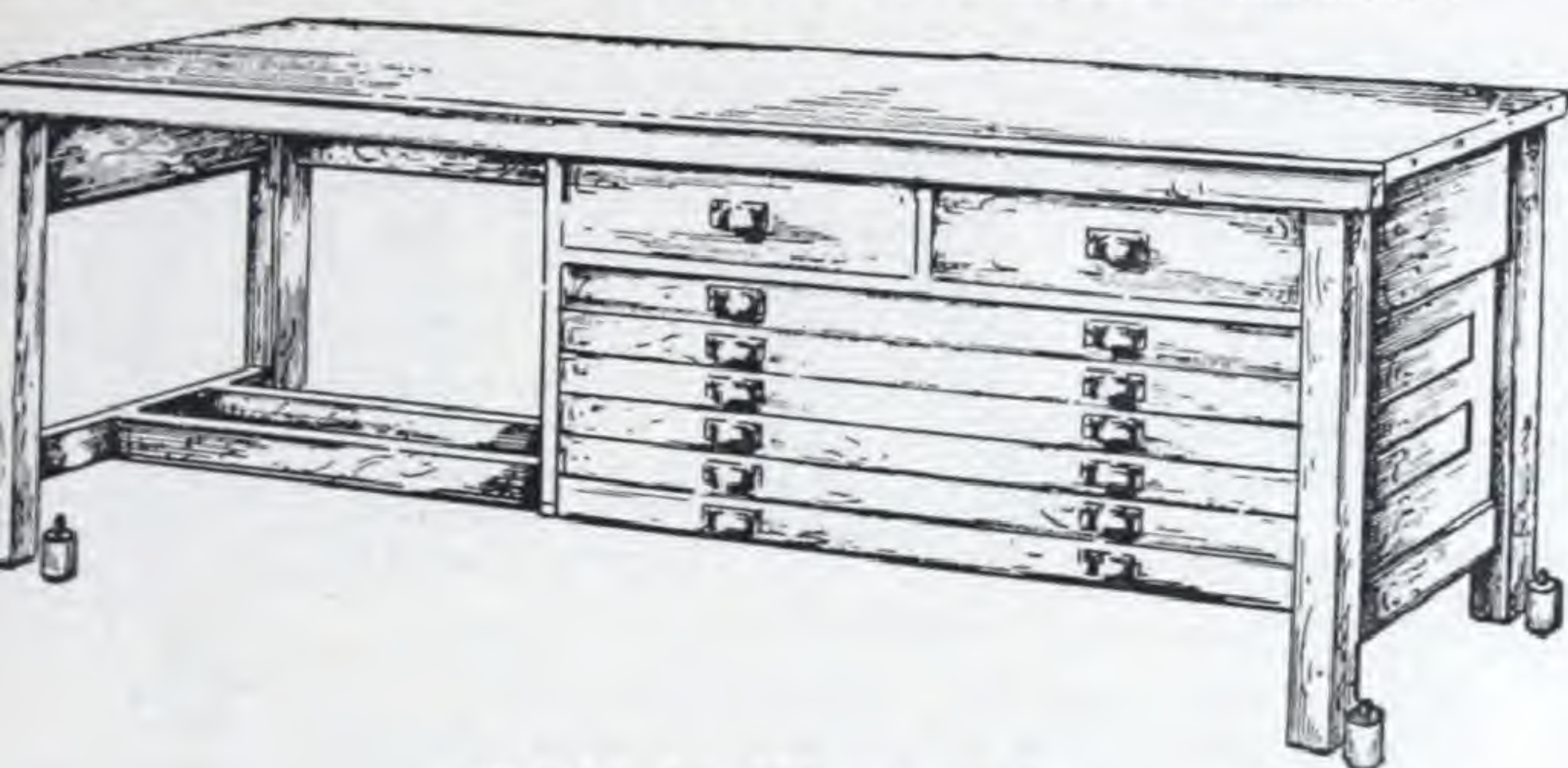


TABLE No. 100 EACH \$

## Drawing and Reference Table and Filing Case Combined

Material, oak, except top. Finish, antique oak.

Top, soft pine, 39 x 84 x 1 $\frac{3}{8}$  inches. Table 34 inches high.

Two small drawers, 21 x 24 x 5 $\frac{1}{4}$  inches inside, in two compartments, x 21 inches and 6 x 21 inches.

Six large drawers 32 x 44 x 2 inches inside. These drawers have a six-inch at top and back of drawer to prevent drawings from slipping out.

Set of four raising blocks, 1, 2 or 3 inches high to adjust the height of table. The dowel of the raising block fits into a dowel hole in the bottom of the leg.

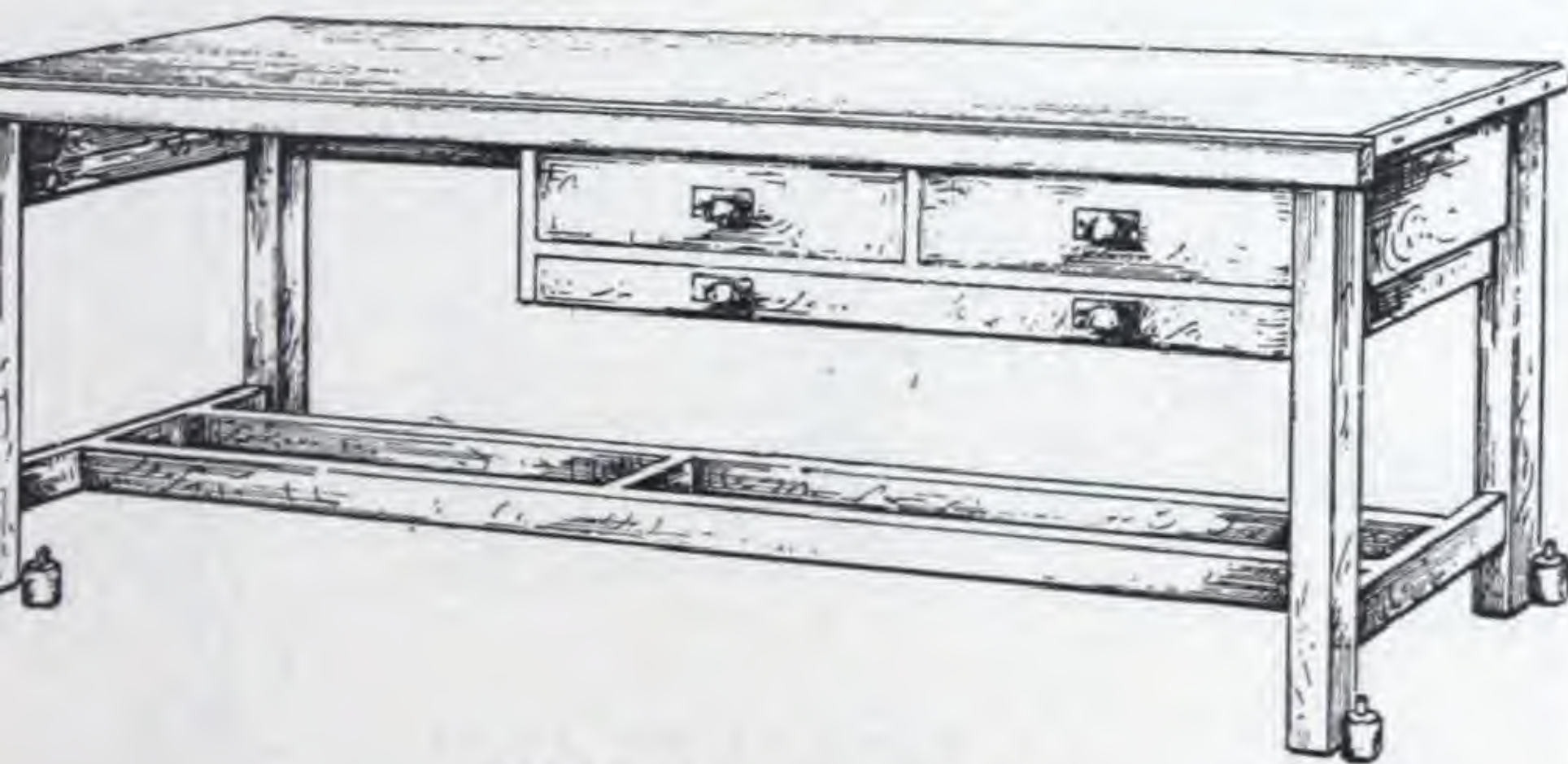


TABLE No. 100A EACH \$

Material, oak, except top. Finish, antique oak.

Top, soft pine, 39 x 84 x 1 $\frac{3}{8}$  inches. Table 34 inches high.

Two small drawers, 21 x 24 x 5 $\frac{1}{4}$  inches inside, in two compartments, x 21 inches and 6 x 21 inches.

One large drawer 32 x 44 x 2 inches inside.

Set of four raising blocks, 1, 2 or 3 inches high to adjust the height of table. The dowel of the raising block fits into a dowel hole in the bottom of the leg.

Locks, Tool Tray and Frame, Loose Inclined Drawing Board, and Holding Wires are extra.



## ELCO DRAWING TABLES AND FILING CABINETS—Continued



TABLE No. 101 EACH \$

Material, oak, except top. Finish, antique oak.

Top, soft pine, 39 x 84 x  $1\frac{3}{8}$  inches. Table 34 inches high.

Two small drawers, 18 x 24 x  $5\frac{1}{4}$  inches inside, in two compartments, 18 x 18 inches and 6 x 18 inches.

Six large drawers, 26 x 38 x 2 inches inside. These drawers have a six-inch lid at top and back of drawer to prevent drawings from slipping out.

Set of four raising blocks, 1, 2 or 3 inches high to adjust the height of table. The dowel of the raising block fits into a dowel hole in the bottom of the leg.

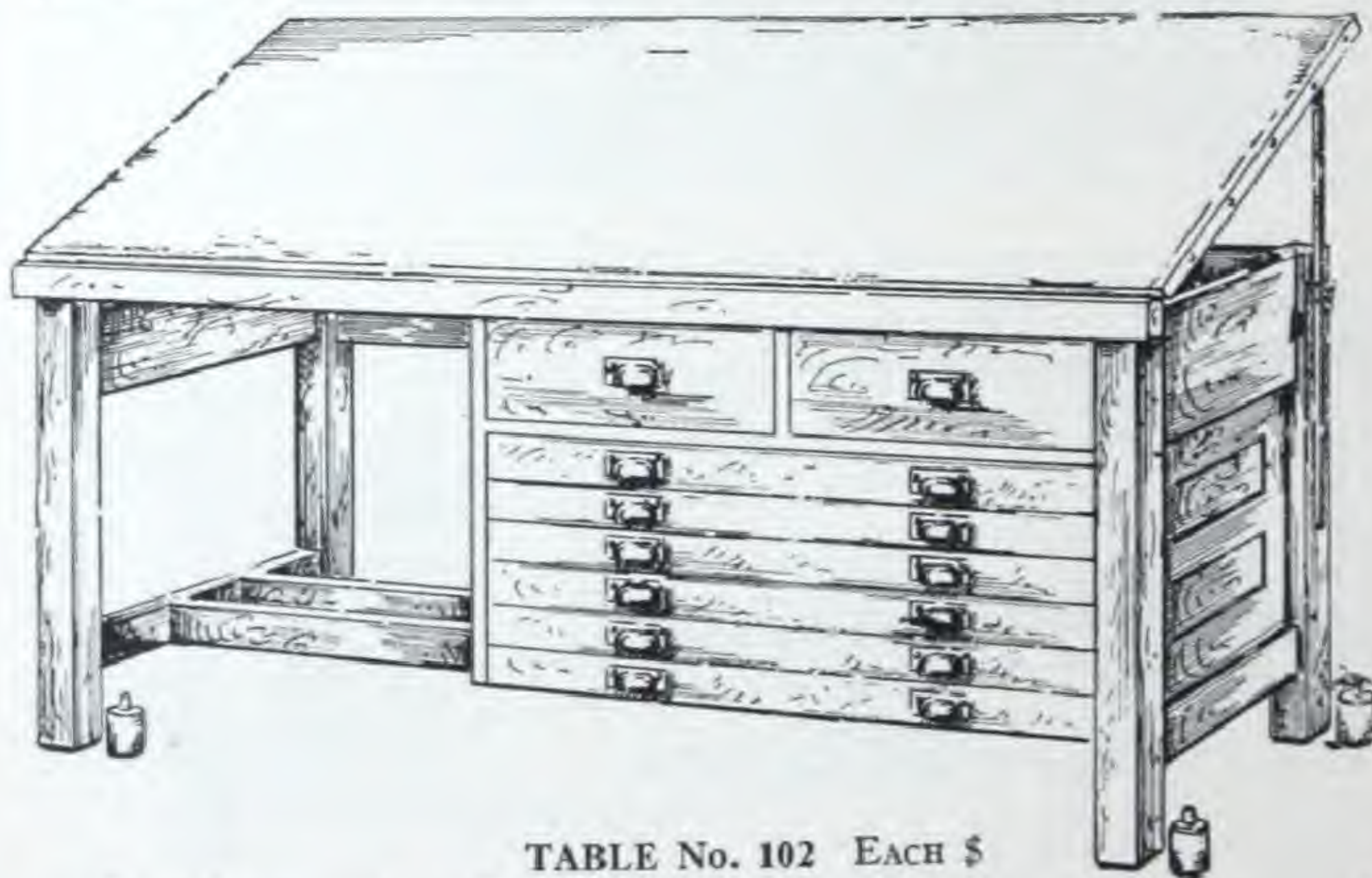


TABLE No. 102 EACH \$

Same drawer space as Table No. 101.

Material, oak, except top. Finish, antique oak.

Top, soft pine, 34 x 72 x  $1\frac{3}{8}$  inches. Table 34 inches high.

Two small drawers, 18 x 24 x  $5\frac{1}{4}$  inches inside, in two compartments, 18 x 18 and 6 x 18 inches.

Six large drawers, 26 x 38 x 2 inches inside. These drawers have a six-inch lid at top and back of drawer to prevent drawings from slipping out.

Set of four raising blocks, 1, 2 or 3 inches high to adjust the height of table. The dowel of the raising block fits into a dowel hole in the bottom of the leg.

Stationary top will be furnished unless an adjustable top is ordered as an extra.



## ELLCO DRAWING TABLES AND FILING CABINETS—Continued

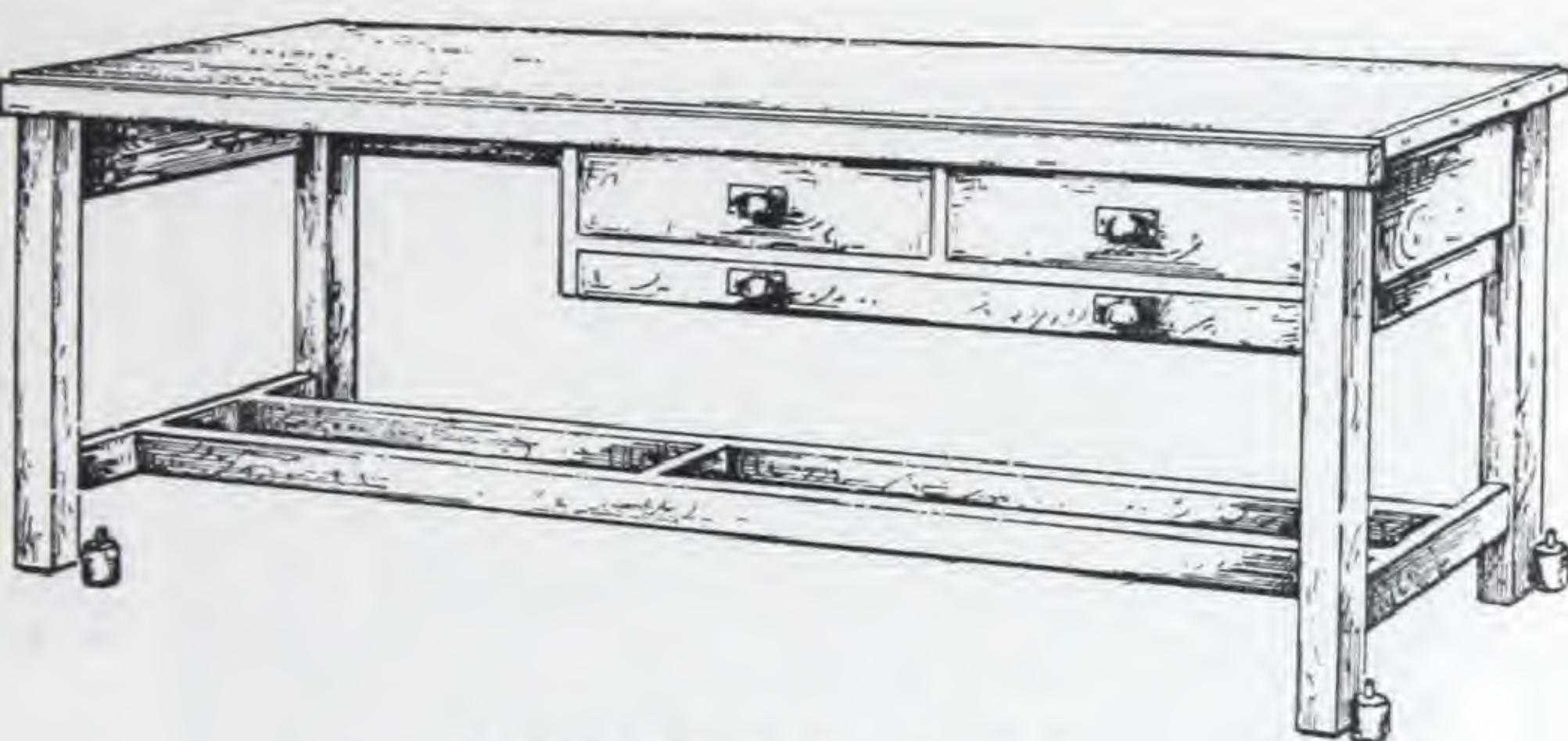


TABLE No. 101A EACH \$

Material, oak, except top. Finish, antique oak.  
 Top, soft pine, 39 x 84 x 1 $\frac{3}{8}$  inches. Height 34 inches.  
 Two small drawers, 18 x 24 x 5 $\frac{1}{4}$  inches inside, in two compartments,  
 18 x 18 inches and 6 x 18 inches.  
 One large drawer 26 x 38 x 2 inches inside.  
 Set of four raising blocks, 1, 2 or 3 inches high to adjust the height of table.  
 The dowel of the raising block fits into a dowel hole in the bottom of the leg.

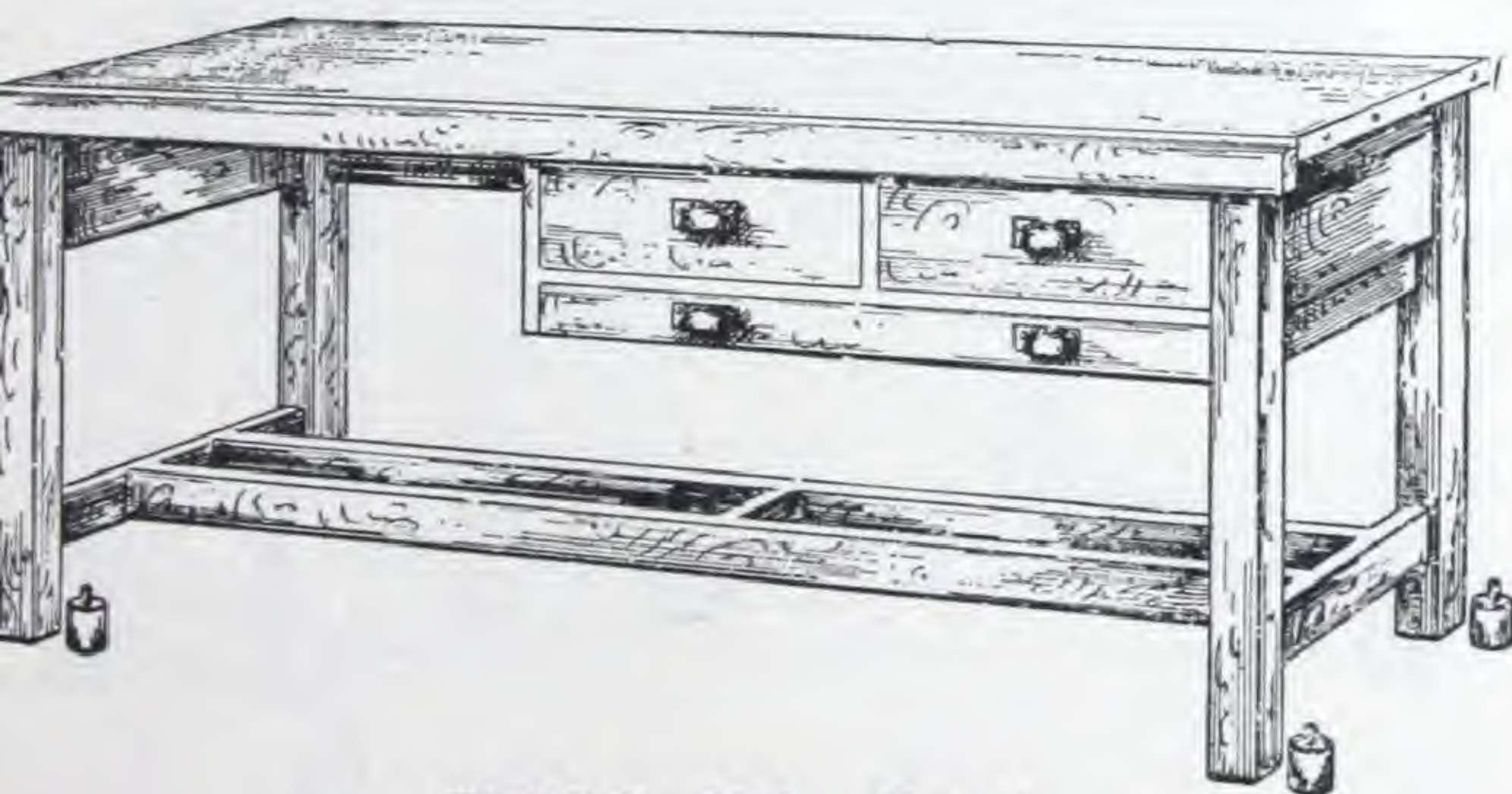


TABLE No. 102A EACH \$

Material, oak, except top. Finish, antique oak.  
 Top, soft pine, 34 x 72 x 1 $\frac{3}{8}$  inches. Table 34 inches high.  
 Two small drawers, 18 x 24 x 5 $\frac{1}{4}$  inches inside, in two compartments,  
 18 x 18 inches, and 6 x 18 inches.  
 One large drawer 26 x 38 x 2 inches inside.  
 Set of four raising blocks, 1, 2 or 3 inches high, to adjust the height of the  
 table. The dowel of the raising block fits into a dowel hole in the bottom of  
 the leg.



## ELLCO DRAWING TABLES AND FILING CABINETS—Continued

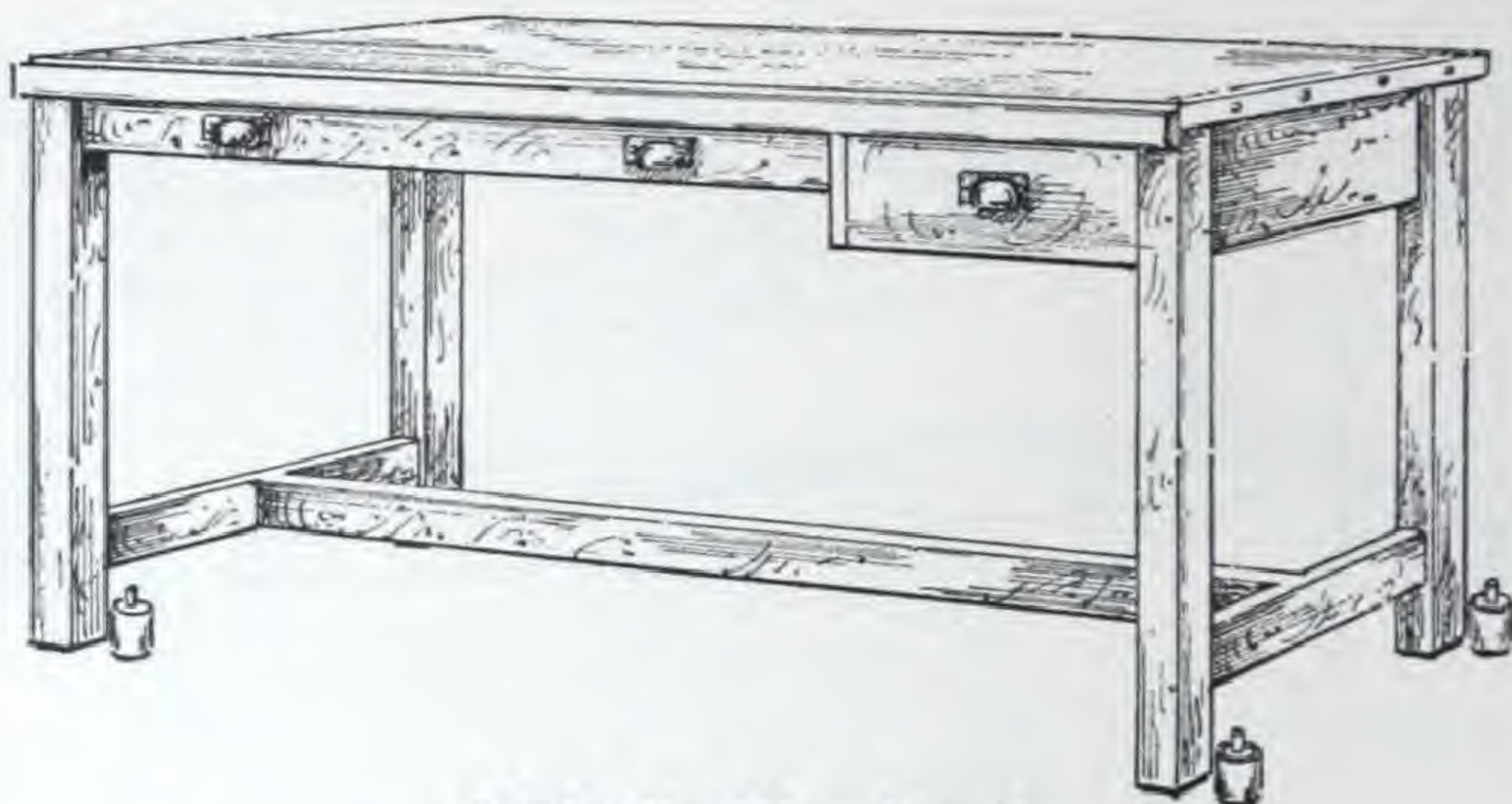


TABLE No. 103 EACH \$

Material, oak, except top. Finish, antique oak.

Top, soft pine, 33 x 60 x  $1\frac{1}{8}$  inches. Height 34 inches.

One small drawer,  $12\frac{1}{2}$  x  $24\frac{1}{2}$  x 4 inches inside, in two compartments,  $12\frac{1}{2}$  x 18 and  $12\frac{1}{2}$  x 6 inches.

One large drawer 26 x 38 x 2 inches inside.

Set of four raising blocks, 1, 2 or 3 inches high, to adjust the height of the table. The raising blocks fit into the bottom of the legs of the table.

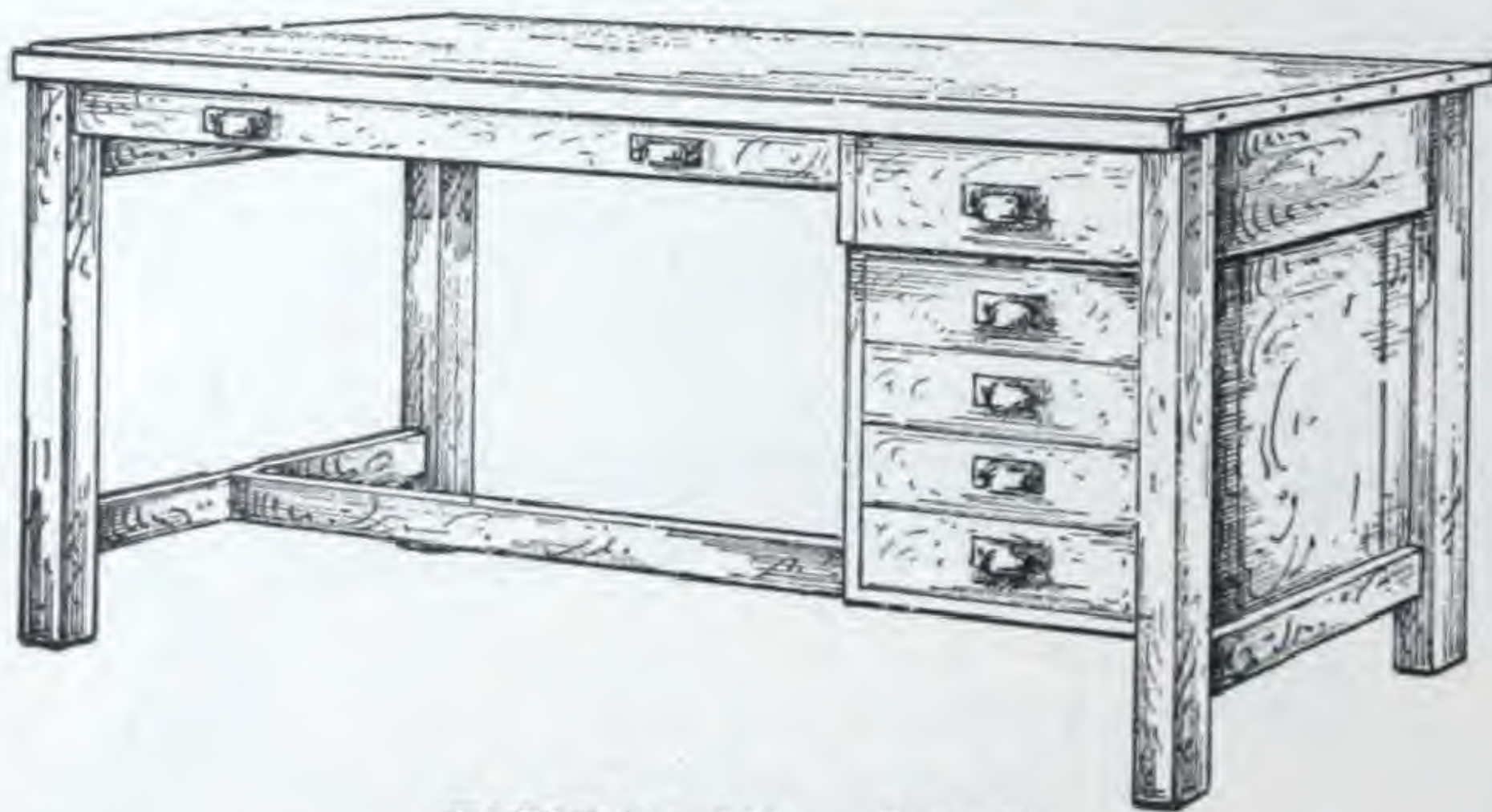


TABLE No. 104 EACH \$

Material, oak, except top. Finish, antique oak.

Top, soft pine, 33 x 60 x  $1\frac{1}{8}$  inches. Height 34 inches.

One small drawer,  $12\frac{1}{2}$  x  $24\frac{1}{2}$  x 4 inches inside, in two compartments,  $12\frac{1}{2}$  x 18 and  $12\frac{1}{2}$  x 6 inches.

One large drawer 26 x 38 x 2 inches inside.

Four small drawers,  $13\frac{1}{4}$  x  $24\frac{1}{2}$  x  $3\frac{1}{2}$  inches inside.

Set of four raising blocks, 1, 2 or 3 inches high.



## ELLCO DRAWING TABLE AND FILING CABINETS—Continued

## SECTIONAL FILING CASE



This cut shows a two-section standard case with 4-inch deep drawer in base. Each section has six drawers. Our holding-down wires will double the capacity of a drawer.

The sectional filing case is designed with loose cap and base.

The base will be furnished with a 4-inch deep drawer, as shown in cut, plain base without drawer or 8-inch sanitary base.

Drawers  $3\frac{5}{16}$  inches deep should be used for filing blue prints or drawings that do not pack close together, and drawers 2 inches deep for tracings. The drawers have a six-inch lid at the top and back to protect drawings. The sectional case enables one to build up the filing cases as requirements demand, and to fill in odd spaces.

The sections are put together without screws or fastenings, but are held in all directions, and are interchangeable.

## SIZES AND DIMENSIONS

	EACH
801 Section of 6 drawers, 26 x 38 x 2" inside; outside measurement, 29 x 41 x 17 $\frac{1}{2}$ "	\$
801A Section of 4 drawers, 26 x 38 x 3 $\frac{1}{8}$ " inside; outside measurement, 29 x 41 x 17 $\frac{1}{2}$ "	
801B Section of 2 drawers, 18 x 26 x 4" inside; outside measurement, 29 x 41 x 5 $\frac{1}{2}$ "	
801C Section of 1 drawer, 26 x 38 x 4" inside; outside measurement, 29 x 41 x 5 $\frac{1}{2}$ "	
801D Section of 6 drawers, 32 x 44 x 2" inside; outside measurement, 35 x 47 x 17 $\frac{1}{2}$ "	
801E Section of 4 drawers, 32 x 44 x 3 $\frac{1}{8}$ " inside; outside measurement, 35 x 47 x 17 $\frac{1}{2}$ "	
801F Section of 2 drawers, 21 x 32 x 4" inside; outside measurement, 35 x 47 x 5 $\frac{1}{2}$ "	
801G Section of 1 drawer, 32 x 44 x 4" inside; outside measurement, 35 x 47 x 5 $\frac{1}{2}$ "	

Special sizes, with loose cap and base as desired, made to order.

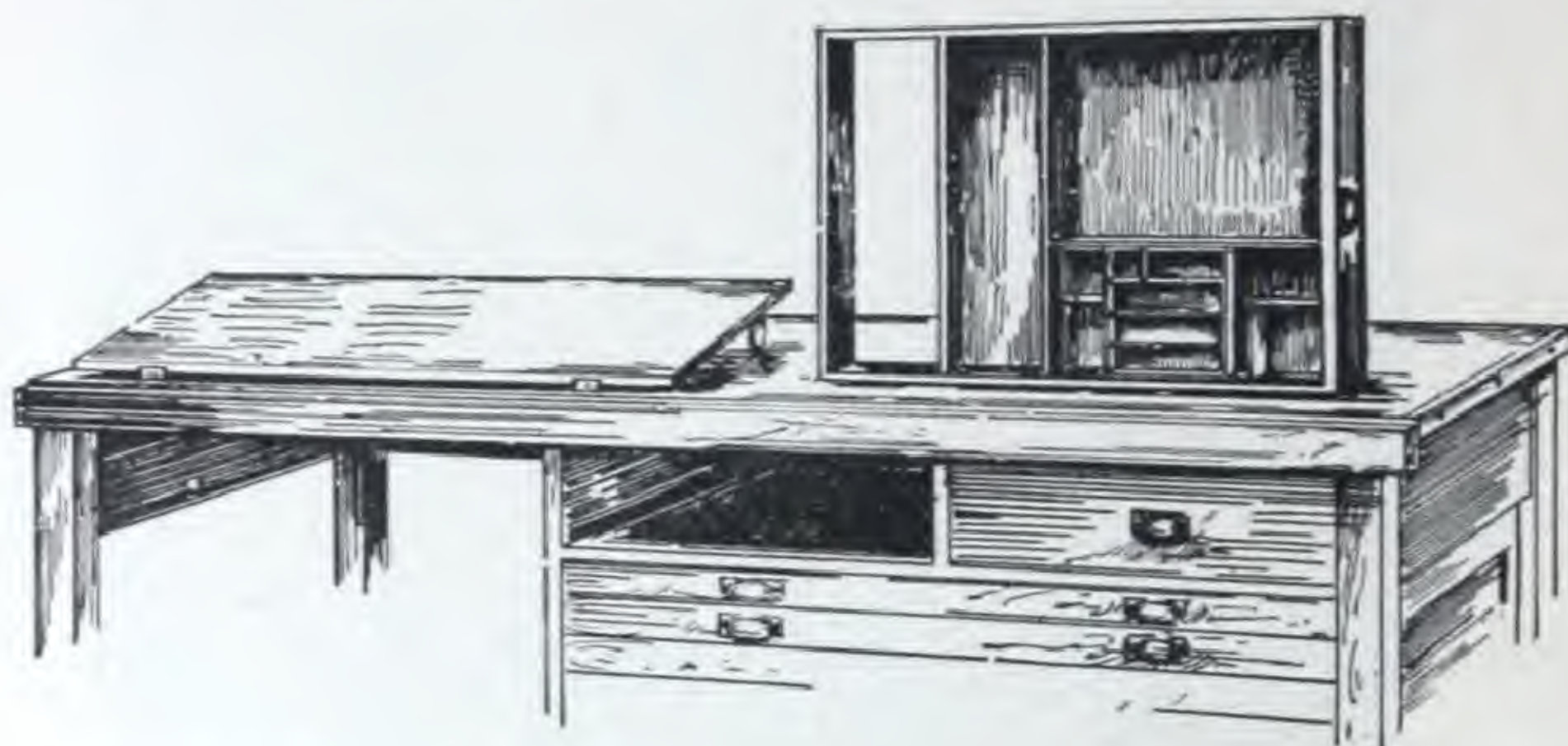
Material, finish and workmanship same as for Ellco Tables

**Holding-Down Wires must be ordered as an extra if wanted**



## ELLCO DRAWING TABLES AND FILING CABINETS—Continued

## DRAWING BOARD AND TOOL TRAY AND FRAME



The Tool Tray and Frame. The tray frame is  $7\frac{3}{4} \times 18$  inches with four compartments for tools, etc., over this slides a tray  $7\frac{3}{4} \times 7\frac{3}{4} \times 1$  inch, with five compartments for pencils, erasers, etc. These are made to fit in the small drawers of any table if desired, and make a very useful addition to the table.

The Loose Inclined Drawing Boards,  $26 \times 38$  and  $32 \times 44$ , are made of soft white pine  $\frac{7}{8}$  inch thick, with two  $2 \times 1\frac{1}{4}$ -inch dovetailed hardwood cross pieces to prevent warping. The board is inclined by turned raising blocks  $2\frac{1}{2}$  inches high.

## DRAFTING BENCH



2802

Seat 24 inches long by  $11\frac{1}{2}$  inches wide.

Maple antique finish.

Height 29 inches.

This bench will be found just right for the tables.

2802 Drafting Bench, EACH \$



## ARTIST'S TABLE



2803

The table was designed by an artist who knew the requirements in his line.

The top is adjustable to any desired angle, and the revolving center is of great convenience when retouching, as it enables them to tack photos flat and then rotate as required.

Notice the swinging shelf which provides a place for inks, water, brushes, etc., and the drawer containing three white glass color slabs, each with six round bottom pockets. One color slab provides a place for opaque black and white, one for opaque red colors and one for transparent ink.

Notice also how the air brush can be locked into this drawer without disconnecting it from the air hose. The large drawer at top is intended for paper and supplies, and is automatically locked by closing small drawer on end of table.

The four-drawer unit and light are not sent with table unless specially ordered, and are then charged for extra.

Height to working surface, 37 inches; width, 42 inches; depth, 31 inches.

2803 Artist Table.....EACH



## PARALLEL RULING ATTACHMENT



2806

Our Parallel Ruling Attachments are very simple in construction and application, consisting of six brass pulleys and best piano wire. It is a most reliable attachment, as with the use of it perfect parallel motion is secured, thus greatly facilitating work in the drafting room.

We can apply this attachment to any kind of Drawing Table or Board, and will be pleased to quote prices to anyone desiring the same.

## ATTACHMENTS ONLY

EACH

2805 Attachments, with directions.....

## ATTACHMENTS AND STRAIGHTEDGES

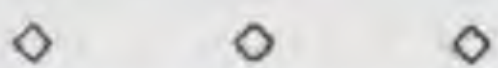
2806 Attachments with mahogany, ebony lined straightedge and directions.  
 Length, inches..... 32      43      55      62  
 Each.....

2807 Attachments, with amber lined straightedge and directions.  
 Length, inches..... 32      43      55      62  
 Each.....

In ordering Straightedge, please state exact length of board to which you intend to apply same.

Full directions furnished with each outfit





STEEL DRAFTSMEN'S STOOLS



2808

2808A

2808C

- 2808    Draftsman's Steel Stool, Wood Seat, 30 inches high.....EACH
- 2808A    Draftsman's Steel Stool, Wood Seat, Revolving Top, adjustable  
          26 inches to 30 inches.....EACH
- 2808B    Draftsman's Steel Stool, Wood Seat, Revolving Top, adjustable  
          30 inches to 34 inches.....EACH
- 2808C    Draftsman's Steel Stool, Wood Seat, Revolving Top, adjustable  
          with Back Rest.....EACH



## DRAFTSMAN'S STOOLS



2810A



2811

EACH

- 2810 Draftsman's Stool, golden oak, wood seat, 30 inches high.....  
 2810A Draftsman's Stool, golden oak, cane seat, 30 inches high.....  
 2811 Draftsman's Stool, golden oak, wood seat, 34 inches high.....  
 2811A Draftsman's Stool, golden oak, cane seat, 34 inches high.....

## DUST BRUSHES



2812 1/2

EACH

- 2812 1/2 Dust Brush, flat, single row of bristles invisible wire drawn, well made, 8-inch brush with 6-inch handle.....



2812

EACH

- 2812 Dust Brush, invisible wire drawn, 8-inch brush, with 6-inch handle.  
 2813 Dust Brush, all bristle, set in pitch, 8-inch brush, with 6-inch handle.



## DRAFTSMEN'S STOOLS—Continued.



2815

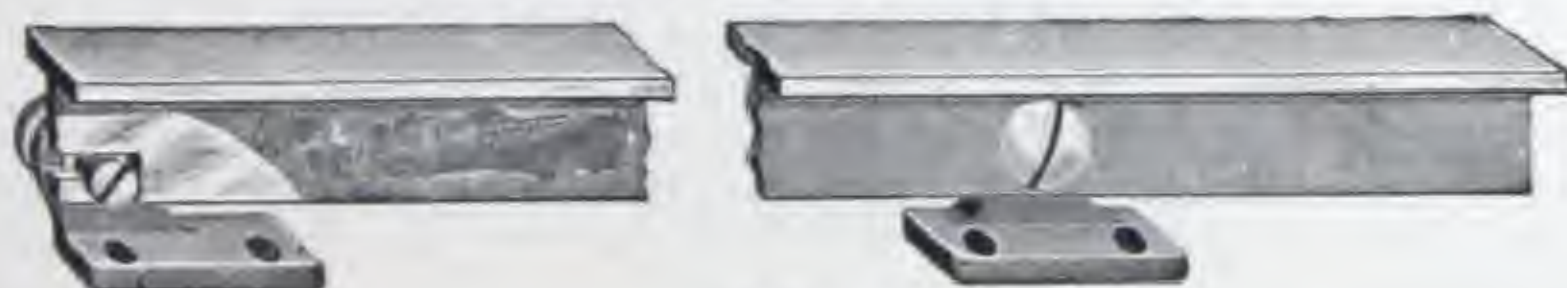


2816

EACH

- 14 Draftsman's Stool, golden oak, wood seat, like No. 2815 but height adjustable from 26 to 30 inches. ....
- 15 Draftsman's Stool, golden oak, wood seat, height adjustable from 31 to 35 inches. ....
- 15A Draftsman's Stool, same as No. 2815, but with cane seat. ....
- 16 Draftsman's Stool, golden oak or imitation mahogany, woven cane seat, height adjustable from 31 to 35 inches. ....
- 16A Draftsman's Stool, same as No. 2816, but with wood seat. ....

### ADJUSTABLE METAL EDGE For Drawing Boards



2818

We furnish a metal T rail or straightedge with attachments to secure it to end, or end and side of drafting board or table. These are ground perfectly straight and are nickel plated. The T square used against this insures more accurate results than could be obtained by working against a wooden board or table.

EACH

- 318 Adjustable Metal Edge, 30 inches. ....
- 319 Adjustable Metal Edge, 36 inches. ....
- 320 Adjustable Metal Edge, 40 inches. ....
- 321 Adjustable Metal Edge, 48 inches. ....



## SECTIONAL FILING CASES

For  
Filing  
Draw-  
ings  
Flat.



Showing  
three  
Sections  
2825C  
Top,  
2825B  
and  
Base  
with  
Drawer,  
2825H.

Sections—The Sections are made in four styles, as follows:

	Outside dimensions of Section			Inside dimensions of Section		
	Length	Width	Height	Length	Width	Depth
Section of 5 drawers, with top attached.	45½ in.	34½ in.	14½ in.	42½ in.	32 in.	2 in.
Section of 5 drawers.	45½ in.	34½ in.	14½ in.	42½ in.	32 in.	2 in.
Section of 3 drawers.	45½ in.	34½ in.	14½ in.	42½ in.	32 in.	3⅝ in.
Section of 1 drawer.	45½ in.	34½ in.	8 in.	42½ in.	32 in.	6 in.

The top is made in two styles only, No. 2825A and No. 2825B. The No. 2825A is a 5 drawer section with oak top attached, and in many instances is found more desirable than No. 2825B, which fits any section.

The drawers slide in grooves, there being no rails between them, and all joints are dovetailed. The back of each drawer is covered for a space of 6 inches with a thin strip to prevent drawings from curling up. The joints are well glued, and glue blocks are used at frequent intervals, making the cases firm and durable.

Top—The top is made in two styles only.

Bases—The bases are made in four styles, fitting any section as follows:

	Outside Dimensions		
Base, plain	45½ in. long	34½ in. wide	4 in. high
Base, with drawer 5¼ in. deep.	45½ in. long	34½ in. wide	9½ in. high
Base, low sanitary	45½ in. long	34½ in. wide	5¾ in. high
Base, high sanitary	45½ in. long	34½ in. wide	22¾ in. high

Material—The sections, top and bases are made of well seasoned and thoroughly kiln dried oak.

Finish and Trimmings—Golden oak stain and filler; three coats of varnish, rubbed and finished in a uniform color; oxidized drawer pulls and label holders.

For Illustrations of Sections, Top and Bases, see pages 187-188

2825A

2825B

2825C

2825D

2825E

2825F



## SECTIONAL FILING CASES—Continued.

## SECTIONS



2825A



2825B



2825C



2825D

EACH

- 2825A Section of 5 Drawers, height  $15\frac{1}{2}$  inches, with top attached,  
drawers 2 inches deep.....
- 2825B Top, height 3 inches.....
- 2825C Section of 5 drawers, height  $14\frac{1}{2}$  inches, drawers 2 inches deep
- 2825D Section of 3 drawers, height  $14\frac{1}{2}$  inches, drawers  $3\frac{5}{8}$  inches deep
- 2825E Holding down wires.....
- 2825F One lock for whole section.....

For Description and Sizes, see page 186



## SECTIONAL FILING CASES—Continued.

## BASES



2825G



2825H



2825I



2825J



2825K

EACH

- 2825G Section, 1 drawer, height 8 inches, drawer 6 inches deep . . . . .  
 2825H Base section, 1 drawer, height 9½ inches, drawer 5¼ inches deep  
 2825I Base section, plain, height 4 inches . . . . .  
 2825J Base section, low sanitary, height 5¾ inches . . . . .  
 2825K Base section, high sanitary, height 22¾ inches . . . . .

For Description and Sizes, see page 186



## COMBINATION DRAWING TABLES



2827

2827 Combination Drawing Table and Cabinet, top 37 x 54 inches...

2828 Combination Drawing Table and Cabinet, top 37 x 60 inches...

2829 Combination Drawing Table and Cabinet, top 40 x 72 inches...

The above combination of our drawer section with drawing board, which is put on with slides so it can be drawn forward, and gives five drawers for filing purposes, is a very neat and durable outfit.

We can furnish above with a drawer underneath six inches deep for storing paper.



2830

2830 Combination Drawing Table and Cabinet, 37 x 54 inches.....

2831 Combination Drawing Table and Cabinet, 37 x 60 inches.....

2832 Combination Drawing Table and Cabinet, 40 x 72 inches.....

The above combination is composed of two filing sections and base, with top so arranged that it can be made to project over the front from six to eight inches, and can be raised and lowered from thirty-five to forty-three inches on the level, and can be tilted to any angle. The parts are securely fastened together and make a very rigid outfit. Drawers are same depth as in our number 2825C.



## STEEL SECTIONAL BLUE PRINT CABINETS

Cap No.  
S2825BUnit No.  
S2825CUnit No.  
S2825DBase No.  
S2825JCap No.  
S2825BUnit No.  
S2825LUnit No.  
S2825DBase No.  
S2825K

When ordering these cabinets specify number and initials  
See page 191



## STEEL SECTIONAL BLUE PRINT CABINETS



Style A  
Drawer showing  
patented  
Hold-Down Irons  
open



Style B  
Drawer showing  
patented  
Hold-Down Irons  
closed



Style C  
Drawer showing  
patented  
Hold-Down Irons  
partly open

Unit No.	Description	Drawer Ins. Dim.			Unit Outside Dim.			Ship. Weight
		Length	Width	Depth	Length	Width	Height	
S2825B	Cap for Units.....	..	..	..	40 $\frac{13}{16}$	29 $\frac{1}{4}$	1 $\frac{3}{16}$	50
S2825S	1-Drawer Unit.....	37	25	7 $\frac{1}{2}$	40 $\frac{13}{16}$	28 $\frac{1}{2}$	9 $\frac{7}{8}$	150
S2825L	3-Drawer Unit—Drawers 2" deep....	37	25	2	40 $\frac{13}{16}$	28 $\frac{1}{2}$	9 $\frac{7}{8}$	200
S2825A	5-Drawer Unit with Cap (small size)	37	25	2	40 $\frac{13}{16}$	28 $\frac{1}{2}$	16 $\frac{3}{16}$	350
S2825C	5-Drawer Unit.....	37	25	2	40 $\frac{13}{16}$	28 $\frac{1}{2}$	15 $\frac{3}{8}$	300
S2825G	3-Drawer Unit—Drawers 3 $\frac{13}{16}$ " deep..	37	25	3 $\frac{13}{16}$	40 $\frac{13}{16}$	28 $\frac{1}{2}$	15 $\frac{3}{8}$	250
S2825I	Flush Base for Units.....	..	..	..	40 $\frac{13}{16}$	28 $\frac{1}{2}$	4	60
S2825M	Sanitary Base 12".....	..	..	..	40 $\frac{13}{16}$	28 $\frac{1}{2}$	12	65
S2825H	Sanitary Base, Low 6".....	..	..	..	40 $\frac{13}{16}$	28 $\frac{1}{2}$	5 $\frac{11}{16}$	60
S2825K	Sanitary Base, High 23".....	..	..	..	40 $\frac{13}{16}$	28 $\frac{1}{2}$	22 $\frac{13}{16}$	75
L2825B	Cap for Units.....	..	..	..	46 $\frac{13}{16}$	36 $\frac{1}{4}$	1 $\frac{3}{16}$	60
L2825G	1-Drawer Unit.....	43	32	7 $\frac{1}{2}$	46 $\frac{13}{16}$	35 $\frac{1}{2}$	9 $\frac{7}{8}$	200
L2825L	3-Drawer Unit.....	43	32	2	46 $\frac{13}{16}$	35 $\frac{1}{2}$	9 $\frac{7}{8}$	250
L2825A	5-Drawer Unit with Cap (large size) .	43	32	2	46 $\frac{13}{16}$	35 $\frac{1}{2}$	16 $\frac{3}{16}$	435
L2825C	5-Drawer Unit.....	43	32	2	46 $\frac{13}{16}$	35 $\frac{1}{2}$	15 $\frac{3}{8}$	375
L2825D	3-Drawer Unit.....	43	32	3 $\frac{13}{16}$	46 $\frac{13}{16}$	35 $\frac{1}{2}$	15 $\frac{3}{8}$	325
L2825I	Flush Base for Units.....	..	..	..	46 $\frac{13}{16}$	35 $\frac{1}{2}$	4	75
L2825H	Sanitary Base, Low 6".....	..	..	..	46 $\frac{13}{16}$	35 $\frac{1}{2}$	5 $\frac{11}{16}$	75
L2825K	Sanitary Base, High 23".....	..	..	..	46 $\frac{13}{16}$	35 $\frac{1}{2}$	22 $\frac{13}{16}$	100



## MANUAL TRAINING BENCHES



### DESCRIPTION OF MANUFACTURE

Each Elliott Bench and Table is built from the most carefully selected hard white maple and birch grown in the north.

Every piece of this lumber is carefully air-dried for months and months under cover and is then fully seasoned in dry kilns. When it finally comes to the machinery to be worked, it has finished its shrinking and all possibility of warping or kinking is gone; it rattles like a bone.

This care in seasoning makes it possible for us to build benches and tables that never even have a tendency to pull apart at the joints. All frame joints are firmly reinforced with  $\frac{1}{2}$  x 5-inch machine bolts and in cabinets  $\frac{3}{8}$  x 4-inch bolts.

The finish is usually shellac, although some frames are finished in oil. All are so finished as to bring out the natural tone of the wood to the best advantage.

The locks and drawer-pulls used are made by reputable lock and hardware manufacturing concerns. All drawer locks are of the standard cylinder pattern, having two keys each, and, when so specified, locks will be used having master-keys to fit all drawers as well. This entails a very nominal extra cost.



## MANUAL TRAINING BENCHES—Continued



No. 2833

Fitted with Abernathy Rapid Acting Vise No. 70D, Metal Dog and Adjustable Bench Top. Weight, 150 lbs.

Dimensions—Top, 52 inches long, 22 inches wide,  $2\frac{1}{4}$  inches thick, 32 inches high. Tool recess, 7 inches wide.

Stand made of  $1\frac{3}{4} \times 3$ -inch strongly mortised joints;  $5 \times \frac{1}{2}$ -inch machine bolt construction.

No. 2833 Manual Training Bench, as described.....EACH

No. 2833J Same as No. 2833 but with 42 inch Top.....EACH



## MANUAL TRAINING BENCHES—Continued



No. 2833A

No. 2833A is fitted with a single drawer, as shown, with two good quality drawer-pulls, but no lock.

This bench is sturdily built and firmly bolted. The framework is finished in oil. It has adjustable steel bench stop and rack for tools.

It is nicely finished with two coats of shellac.

As illustrated, with Abernathy Roller Nut Rapid Acting Vise No. 70D. Height, 32 inches. Top, 2¼ inches thick. Working Top, 14¼ inches wide. Tool Recess, 7¾ inches wide. Drawer, 22 x 19 x 6 inches. Top, 42 inches long.

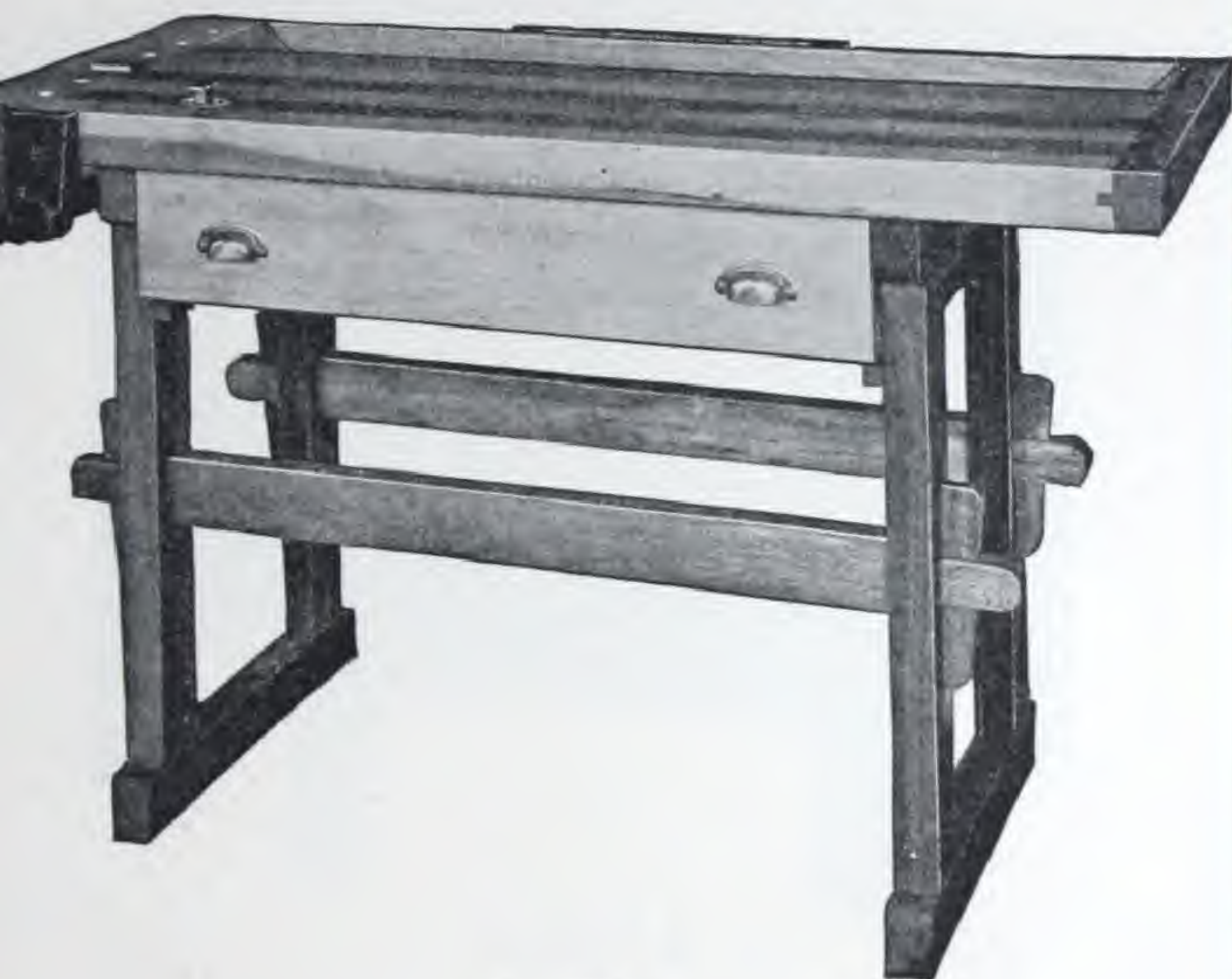
Shipping Weight, 130 pounds.

EACH

- |           |   |
|-----------|---|
| No. 2833A | Manual Training Bench, as described .....       |
| No. 2833B | Same as No. 2833A with Top 52 inches long ..... |
| No. 2833C | Same as No. 2833A without drawer .....          |



## MANUAL TRAINING BENCHES—Continued



No. 2833 D

Fitted with Abernathy Rapid Acting Vise No. 70D. Metal dog, adjustable bench stop.

Dimensions—Top 52 inches long, 22 inches wide,  $2\frac{1}{4}$  inches thick, 32 inches high, tool recess, 7 inches wide. Drawer 32 x 19 x 6 inches fitted with bronzed pulls. Stand made of  $1\frac{3}{4}$  x 3 inches, strongly mortised joints. Also notice our Good Key construction, which is superior to any other construction, to make the bench steady and durable.

EACH

No. 2833D Manual Training Bench, as described.....

No. 2833E Same as No. 2833D, fitted with two Abernathy Rapid Acting Vises No. 70D two metal dogs. The extra vise fitted on opposite end.....

**Shipped Knocked Down.**



## MANUAL TRAINING BENCHES—Continued

No. 2833 $\frac{1}{2}$ F

Fitted with Abernathy Rapid Acting Vise No. 70D. Metal dog and adjustable bench stop.

Weight 200 lbs.

Dimensions—Top, 52 inches long, 22 inches wide, 2 $\frac{1}{4}$  inches thick, 32 inches high. Tool recess, 7 inches wide.

Provided with four drawers, 15 $\frac{1}{2}$  x 17 x 5 inches and one large drawer 32 x 17 x 5 inches, all fitted with bronze Pulls and brass cylinder locks, master keyed.

Frame Part strongly mortised with 5 x  $\frac{3}{8}$  inch bolt construction. Legs and rails in frame 2 x 3 inches. EACH

No. 2833 $\frac{1}{2}$ F Manual Training Bench, as described.....

No. 2833 $\frac{1}{2}$ G Same as No. 2833 $\frac{1}{2}$ F, but fitted with six drawers 15 $\frac{1}{2}$  x 17 x 5 inches.



## MANUAL TRAINING BENCHES—Continued



No. 2833H

## TEN DRAWER DOUBLE BENCH

The working top is unusually large, with holes mortised on each end for ch stops, of which two are furnished with each bench.

Regularly this bench comes provided with two Abernathy Acting Vises No. 70D and two adjustable Stops, as shown in the illustration.

It includes general tool drawers and four private drawers on each side, presenting a side appearance like our No. 2833½G Bench.

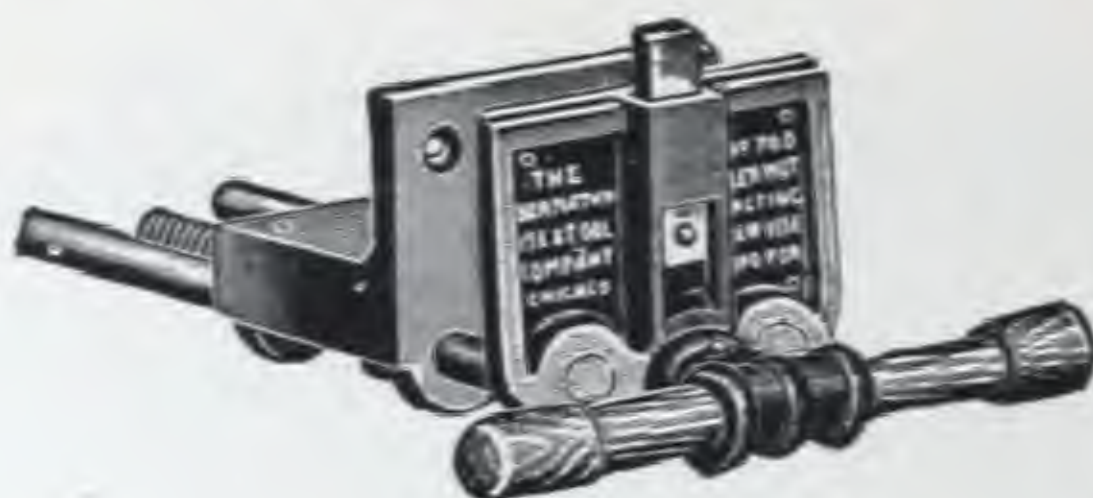
With one Abernathy Roller Nut Rapid Acting Vise No. 70D on each front. Height 32 inches. Top, 52 x 36 x 2¼ inches. Tool Recess, 8 inches wide. General Drawers, 32 x 17 x 5 inches. The eight Private Drawers, 15½ x 17 x 5 inches. Legs, 2 x 3 inches.

No. 2833H Manual Training Bench, as described,.....EACH

Shipping Weight, 350 pounds.



## MANUAL TRAINING BENCH VISES



70D

View Showing the Parts and an Assembled  
Roller Nut Vise

## ROLLER NUT VISES

Rapid acting or continuous screw adjustments. The simplest in construction, the longest wearing, the most satisfactory in action of any rapid-acting vise on the market.

Rapid acting, continuous screw vises have been designed to overcome apparent defects in other vise constructions of this general type.

Unnecessary complication is a detriment in any mechanical device. Roller Nut Vises have but one part in addition to the elements of an old style slow acting screw vise, and that is the roller, which is a large, substantial casting, practically impossible to put out of order even by abuse.

Springs, particularly when frail or requiring close adjustments, are unreliable and the source of considerable trouble. Roller Nut Vises have no springs whatever, but depend upon the weight of the rollers for their action, and this is a permanent factor.

Sectional Nuts are used in all rapid acting screw vises, and the tendency, particularly after a little wear, is for the nut section to rise under tension and release the work. Roller Nut Vises are so constructed that it is absolutely impossible for the nut section to rise or the screw to spring out of engagement.

The roller is a practically balanced cylinder containing a tapered dovetail mortise into which a nut section is removably fitted; the roller simply hangs upon the screw, and due to its weight and the resulting frictional contact between these two parts the roller rolls in whichever direction the screw is turned.

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2836 Sta

2837 Sta

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2844 S

2844 1/2 S



283

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penetrates  
They

2838 Nee

2839 Nee

2840 Nee

2841 Nee

2842 Nee



## STAMPED STEEL THUMB TACKS



2835



2836



2837

These Stamped Steel Tacks are made of one piece of tough, hard steel (specially made for this purpose) and are of the very best quality. They have double finished points, so that they make an excellent substitute for the regular thumb tacks, when it is desired to have a lower priced article.

PER BOX OF 100 PER DOZ.

- 5 Stamped Steel Thumb Tacks, flat heads,  
 $\frac{5}{16}$  inch diameter.....  
 6 Stamped Steel Thumb Tacks, flat heads,  
 $\frac{3}{8}$  inch diameter.....  
 7 Stamped Steel Thumb Tacks, flat heads,  
 $\frac{1}{2}$  inch diameter.....

## SOLID STEEL THUMB TACKS



2843



2844

2844 $\frac{1}{2}$ 

These Solid Steel Head Thumb Tacks have a very thin and strong head, constructed as to prevent the pin from pulling out or pushing through. They are neat in appearance and very durable.

PER BOX PER DOZ.  
OF 100

- 8 Solid steel, round heads,  $\frac{3}{8}$  inch diameter.....  
 9 Solid steel, round heads,  $\frac{7}{16}$  inch diameter.....  
 $\frac{1}{2}$  Solid steel, round heads,  $\frac{1}{2}$  inch diameter.....

## NEEDLE POINT THUMB TACKS



2838



2839



2840



2841



2842

These tacks are of one piece tempered steel. The long sharp "Needle Point" penetrates any wood easily and will not mar. They are put up 50 tacks to a box.

PER BOX

- Needle Point Thumb Tacks,  $\frac{5}{16}$  inch diameter.....  
 Needle Point Thumb Tacks,  $\frac{3}{8}$  inch diameter.....  
 Needle Point Thumb Tacks,  $\frac{7}{16}$  inch diameter.....  
 Needle Point Thumb Tacks,  $\frac{1}{2}$  inch diameter.....  
 Needle Point Thumb Tacks,  $\frac{9}{16}$  inch diameter.....



## THUMB TACKS



2845

2850

2856

2860

2861

## BRASS THUMB TACKS

Steel Points Swaged—One dozen on a block  
Round Heads

		PER GROSS	PER DOZ.
2845	$\frac{3}{8}$ inch diameter.....		
2846	$\frac{7}{16}$ inch diameter.....		
2847	$\frac{1}{2}$ inch diameter.....		
2848	$\frac{5}{8}$ inch diameter.....		

## Beveled Heads

		PER GROSS	PER DOZ.
2849	$\frac{3}{8}$ inch diameter.....		
2850	$\frac{7}{16}$ inch diameter.....		
2851	$\frac{1}{2}$ inch diameter.....		
2852	$\frac{5}{8}$ inch diameter.....		

## GERMAN SILVER THUMB TACKS

Steel Points, screwed in and riveted—One dozen on a block  
Round Heads

		PER DOZ.
2855	$\frac{7}{16}$ inch diameter.....	
2856	$\frac{1}{2}$ inch diameter.....	
2857	$\frac{5}{8}$ inch diameter.....	

## Beveled Heads

		PER DOZ.
2858	$\frac{7}{16}$ inch diameter.....	
2859	$\frac{1}{2}$ inch diameter.....	
2860	$\frac{5}{8}$ inch diameter.....	

## ALTENEDER'S GERMAN SILVER THUMB TACKS

These Thumb Tacks are thoroughly well made. The steel pins are of proper length and thickness and are screwed into the heads and warranted not to come out. Packed one dozen on a block.

		PER DOZ.
2861	German silver, beveled heads, $\frac{3}{8}$ inch diameter.....	
2862	German silver, beveled heads, $\frac{1}{2}$ inch diameter.....	
2863	German silver, beveled heads, $\frac{5}{8}$ inch diameter.....	



## "ANGLE-HOLD" PICTURE HOOKS

are "Hang-Ups" for Pictures, Cabinets, Shelves, Cards, Calendars, or anything weighing up to 100 Pounds on Wood, Cement or Plaster Walls.

The flat back will not mar. The greater the weight the tighter the hug.ails are tempered steel with sharp points.

Cuts are exact size.



Packet Contains	10	25	50	100	
Hook Sustains	10	25	50	100	3 Hooks
Box Contains	24	24	12	12	100 Pounds
					12 Packets
			PER DOZEN PACKETS	PER PACKET	

64 Angle Hold Picture Hooks.....

## GLASS HEAD "PRESS-IN PIN-TACKS"

Give a "Thousand Uses." Transparent and lasting; the glass heads take the color of the thing they are pressed into. For cards, calendars, photographs, curtains or any little or light thing to be pinned or tacked on "Press-in Pin-Tacks" are clean, colorless, dustless and will not rust.

Made of tough clear glass and finely tempered steel points.

Cuts are exact size.



No. 0

No. 1

No. 2

Six of a single number in handsome packet.  
Twelve packets of a number in a box.

PER DOZEN PACKETS PER PACKET

64½ Press-in Pin-Tacks.....



## HORN CENTERS



2865

2866

EACH

2865 Horn Center, plain,  $\frac{1}{2}$  inch diameter. ....2866 Horn Center, with German silver rim,  $\frac{3}{4}$  inch diameter. ....

## THUMB TACK LIFTERS

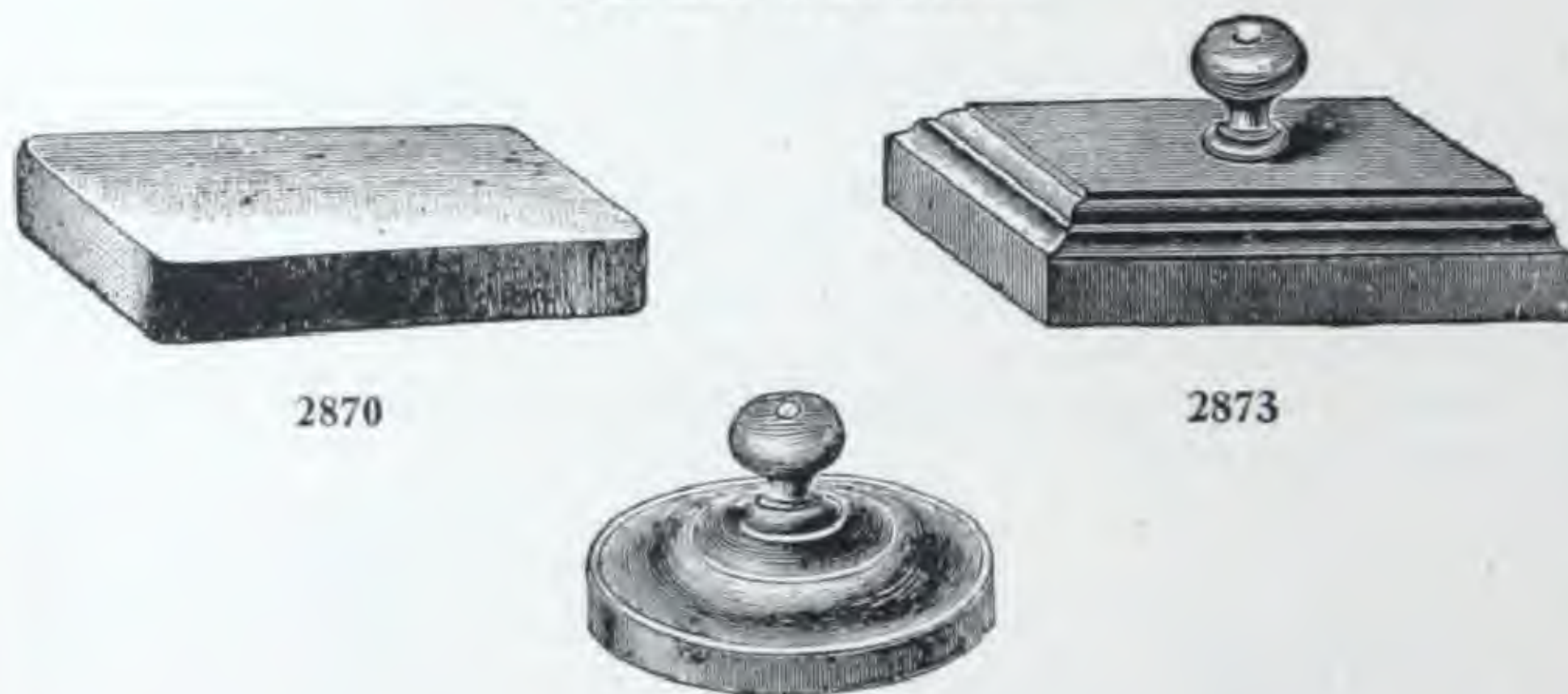


2867

EACH

2867 Steel, nickel-plated, with flange, holding tacks secure. ....

## PAPER WEIGHTS



2870

2873

2872

EACH

2870 Lead Paper Weight, covered with leather,  $4 \times 2\frac{1}{4} \times \frac{11}{16}$  inch, about  $2\frac{3}{4}$  pounds. ....2871 Lead Paper Weight,  $4\frac{1}{4} \times 2\frac{1}{2} \times 1$  inch, about  $3\frac{3}{4}$  pounds. ....

2872 Iron Paper Weight, round, with knob, small. ....

2873 Iron Paper Weight, square, with knob, large. ....

The Iron Paper Weights are finely finished and cloth lined. The knobs are of polished hardwood.



# PENCILS HARDTMUTH'S



2875

PER DOZ.

- 5 Koh-i-noor Hexagon, yellow polish, in 17 degrees: 6B, 5B, 4B, 3B, 2B, B, HB, F, H, 2H, 3H, 4H, 5H, 6H, 7H, 8H, 9H.....

## "KOH-I-NOOR" PENCILS WITH RUBBER TIPS

- 6 Koh-i-noor Hexagon, HB degree only, with rubber tips.....



2877

PER DOZ.

- 7 Koh-i-noor Copying Ink Pencils, violet, round.....



2878

EACH

- 8 Koh-i-noor Artists' Pencil, with lead, double pointed.....  
9 Koh-i-noor Artists' Pencil, with lead, single pointed.....



2880

PER BOX

- 0 Koh-i-noor Leads, six in box, all grades, from 6B to 8H.....



### "ELECTRIC" DETAIL PENCILS

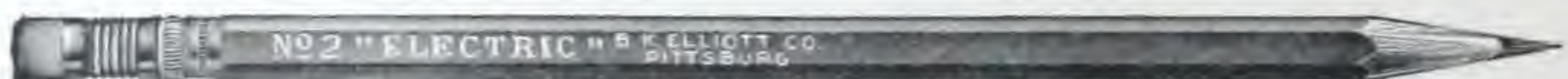
The progress of the "Electric" Pencil and its growth in popular favor has been phenomenal. The splendid reputation it enjoys has been well deserved, for the article represents all that is best in pencil making. From its superb lead to the beautiful yellow polish, every care has been exercised to make the pencil as perfect as possible. The untipped No. 2890 is made in 10 degrees, from 2B to 6H. This is essentially a drawing pencil and is largely used by engineers, architects, designers, etc., as the fine quality of the lead and the many grades in which it is made, appeal particularly to those requiring an exceptionally high grade detail pencil.



2890

PER DOZ.

2890 Electric Detail Pencils, 2B to 6H.....



2891

The "Electric" Pencil with white rubber tip, is in high favor as an office pencil, and is made in degrees Nos. 2 and 3.

PER DOZ.

2891 Electric Pencils, hexagon, yellow polish, rubber tip.....

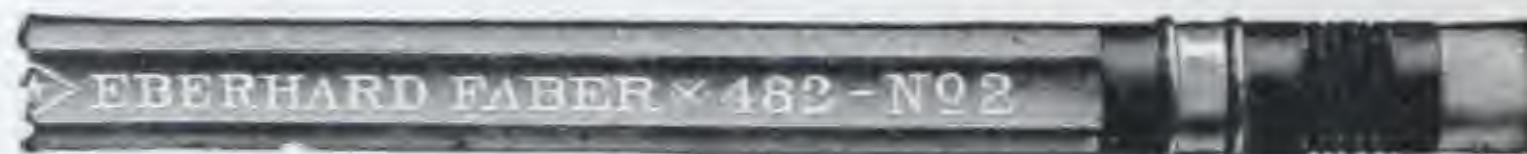
### E. FABER'S "MONGOL" PENCILS



2892

PER DOZ.

2892 E. Faber's Mongol Pencils, hexagon, yellow polish, in degrees: 6B, 3B, 2B, B, HB, F, H, 2H, 3H, 4H, 5H, 6H.....



2893

PER DOZ.

2893 E. Faber's Mongol Pencils, hexagon, yellow polish, rubber tip, degree Nos. 1, 2, 3 and 4.....



## DIXONS PENCILS



2881

PER DOZ.

- 1 Dixon's Eldorado—"The Master Drawing Pencil." Made in seventeen leads, one for every need or preference. In degrees as follows 6B, 5B, 4B, 3B, 2B, B, HB, F, H, 2H, 3H, 4H, 5H, 6H, 7H, 8H, and 9H.

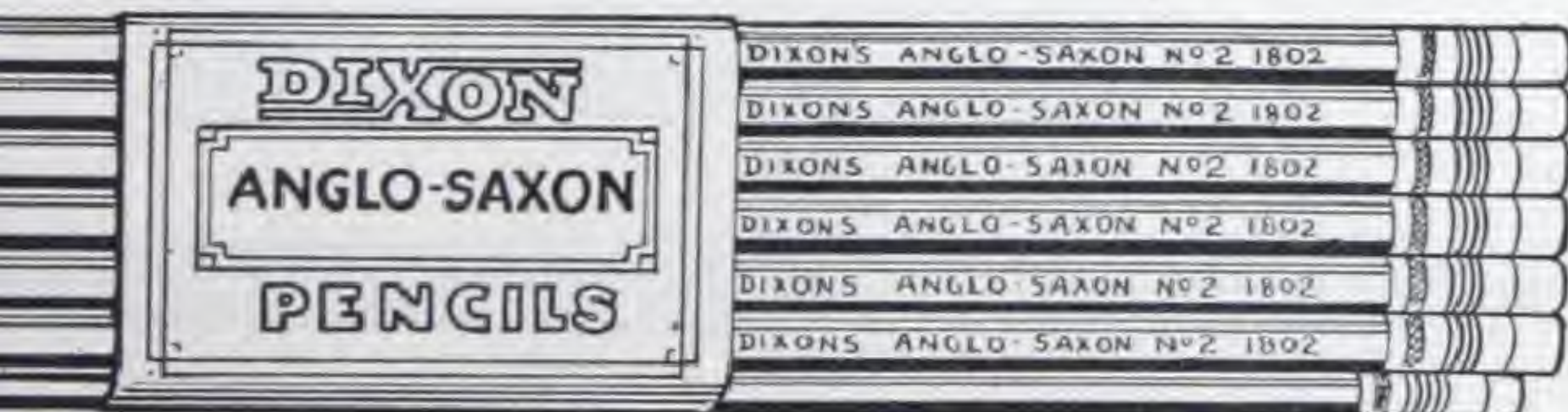


2882A

PER DOZ. PER GROSS

- 2 Grade No. 1.  
2A Grade No. 2.  
2B Grade No. 2 $\frac{5}{10}$ .  
2C Grade No. 3.  
2D Grade No. 4.

A standard office pencil of superior merit. Of its five leads, the No. 2 is most used for general work, although No. 2 $\frac{5}{10}$  is also very popular.



2883A

PER DOZ. PER GROSS

- Grade No. 1.  
A Grade No. 2.  
B Grade No. 3.  
C Grade No. 4.  
Red Rubber Tips, Gilt Ferrule Meadow Green finish.



## HARDTMUTH'S MEPHISTO PENCILS



2894

PER DOZ.

- 2894 Hardtmuth's Mephisto Pencils, hexagon, black polish. In six degrees, as follows: Nos. 1=BBB, 2=B, 3=HB, 4=HH, 5=HHH, 6=HHHH.



2895V

PER DOZ.

- 2895V Mephisto Copying Ink Pencils, No. 73B, violet, round.....  
 2895B Mephisto Copying Ink Pencils, No. 73B, blue, round.....  
 2895D Mephisto Copying Ink Pencils, No. 73B, black, round.....  
 2895G Mephisto Copying Ink Pencils, No. 73B, green, round.....  
 2895R Mephisto Copying Ink Pencils, No. 73B, red, round.....  
 2895 $\frac{1}{4}$  Mephisto Copying Ext. Hard Pencils, No. 73B, violet, round.  
 2895 $\frac{1}{2}$  Mephisto Copying Red Tip Pencils, No. 77, violet, round....

## DIXON'S DUPLIGRAPH COPYING PENCILS



2896

PER DOZ.

- 2896 Dupligrath Copying Pencil.....

## DIXON'S ROUND SHAPE MAMMOTH



2897

PER DOZ.

- 2897 Dixon Mammoth Size, red.....  
 2898 Dixon Mammoth Size, blue.....



## A. W. FABER'S "CASTELL" POLYCHROMOS COLORED PENCILS



2899

## LIST OF COLORS

1 White	21 Light Blue	41 Raw Sienna
2 Zinc Yellow	22 Sky Blue	42 Gold Ochre
3 Lemon Cadmium	23 Cobalt Blue	43 Burnt Yellow Ochre
4 Light Chrome	24 Ultramarine	44 Brown Ochre
5 Light Cadmium	25 Paris Blue	45 Burnt Sienna
6 Dark Cadmium	26 Prussian Blue	46 Venetian Red
7 Naples Yellow	27 Indigo	47 Brick Red
8 Dark Chrome	28 Delft Blue	48 Terra Cotta
9 Orange	29 Red Violet Lake	49 Indian Red
10 Terre Verte	30 Blue Violet Lake	50 Burnt Carmine
11 Olive Green	31 Pink Madder Lake	51 Raw Umber
12 Mineral Green	32 Madder Carmine	52 Bistre
13 French Green	33 Rose Pink	53 Van Dyke Brown
14 Green Bice	34 Carmine Lake	54 Burnt Umber
15 Sap Green	35 Carmine Extrafine	55 Sepia
16 Hooker's Green No. 1	36 Scarlet Lake	56 Warm Sepia
17 Hooker's Green No. 2	37 Saturn Red	57 Light Gray
18 Viridian	38 Pale Vermilion	58 Neutral Tint
19 Vegetable Green	39 Dark Vermilion	59 Payne's Gray
20 Prussian Green	40 Light Ochre	60 Ivory Black

PER DOZ.

2899 A. W. Faber's Castell Polychromos Wax Crayon Pencils, as listed above, each, \$ .10.



2900

2900 A. W. Faber's Castell Polychromos Wax Crayon Pencils in boxes.

Assorted colors, box of..... 6 12 18 24 36 48

Per box.....



2901B

PER DOZ.

2901R	J. Faber's, round, red, colored pencils.....
2901B	J. Faber's, round, blue, colored pencils.....
2901G	J. Faber's, round, green, colored pencils.....
2901Y	J. Faber's, round, yellow, colored pencils.....



## DIXON'S CRAYON PENCILS



## DIXON'S "BEST" COLORED PENCILS, ROUND SHAPE

PER DOZ.

- 2902 Dixon's "Best" Colored Pencils, round shape. Made in 24 colors each pencil finished in same color as its "lead," as follows (in order of chromatic scale): white, pink, lake red, carmine, red, orange, lemon yellow, golden yellow, light green, olive green, green, sky blue, azure, indigo blue, blue, purple, violet, yellow ochre, burnt ochre, terra cotta, sepia, brown, gray, and black

## DIXON'S BEST CRAYON PENCILS, IN SETS



2902B

PER BOX

- 2902A Best Crayon Pencil, 7 in set, assorted colors .....  
 2902B Best Crayon Pencil, 12 in set, assorted colors.....  
 2902C Best Crayon Pencil, 24 in set, assorted colors.....



## PENCILS—Continued.



2902½

EACH

2902½ Autopoint Pencil.....

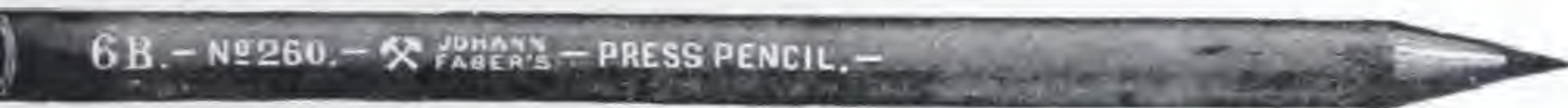
Autopoint Pencils combine all the best points of wood and mechanical pencils. Absolutely no objectionable features. They are light, quick, convenient and perfectly balanced. The hand grips a highly polished wood exterior—the mechanism is simple and trouble-proof. No other mechanical pencil can be filled as quickly and as easily as the Autopoint.



EACH

2903½ Eversharp Pencil No. 151.....

Eversharp No. 151 is just like other Eversharps, inside. It has the patented steel tip that holds the lead firmly, and all other exclusive Eversharp features. The only difference is in the finish—the eraser is exposed and always ready for use, and the barrel is enameled in black, blue or red. We also carry other numbers of Eversharp Pencils.

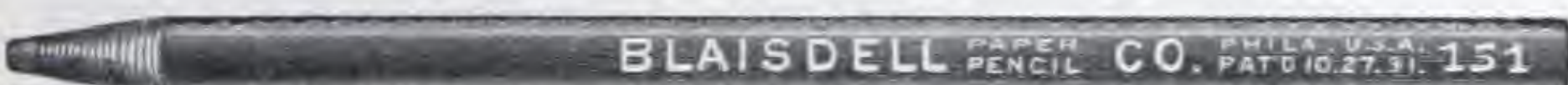


2903

PER DOZ.

2903 J. Faber's "Press" Pencil, round, natural polish, extra large, soft, smooth lead, 6B.....

## BLAISDELL'S COLORED CRAYONS



2904A

PER DOZ.

2904A Blaisdell's Crayon No. 151, blue.....

2904B Blaisdell's Crayon No. 151, black.....

2904C Blaisdell's Crayon No. 153, green.....

2904D Blaisdell's Crayon No. 154, yellow.....

2904E Blaisdell's Crayon No. 155, brown.....

2904F Blaisdell's Crayon No. 156, white.....

2904G Blaisdell's Crayon No. 161, red.....

2904H Blaisdell's Crayon No. 162, pink.....

2904I Blaisdell's Crayon No. 167, purple.....



## PENCIL LENGTHENERS

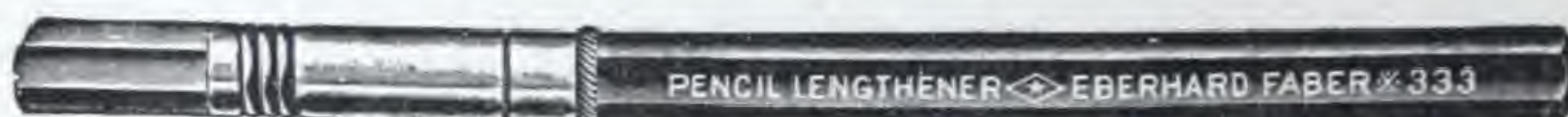
(For utilizing short ends of Pencils)



2906

EACH

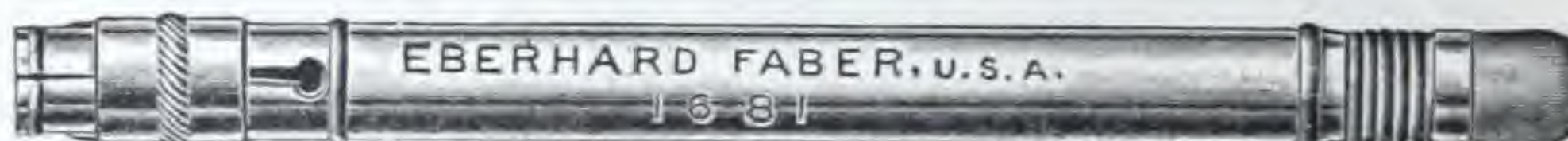
2906 Hexagon, brass, nickel-plated ferrule, threads cut in ferrule. . . . .



2907

EACH

2907 Fitted with short hexagon, yellow polished pencils. . . . .



2908

EACH

2908 Pencil Lengthener, round, 4 1/8 inches long. Nickel plated with nickel slide ring and red rubber tip. . . . .



2910

EACH

2910 Pencil Point Protector, hexagon, with rubber. . . . .



2912

EACH

2912 Pencil Point Protector, round conical shape. . . . .



2913

PER DOZ.

2913 Rubber Pencil Tips, hexagon top. . . . .

2913G Rubber Strips for Pencil Tips, gray. . . . .

2913R Rubber Strips for Pencil Tips, red. . . . .



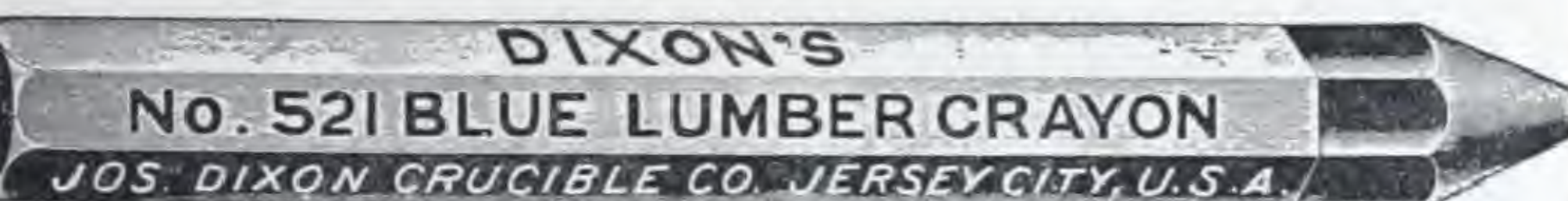
## DIXON'S LUMBER CRAYON HOLDER



2914

PER DOZ.

2914 Dixon Lumber Crayon Holder.....



2915B

PER DOZ.

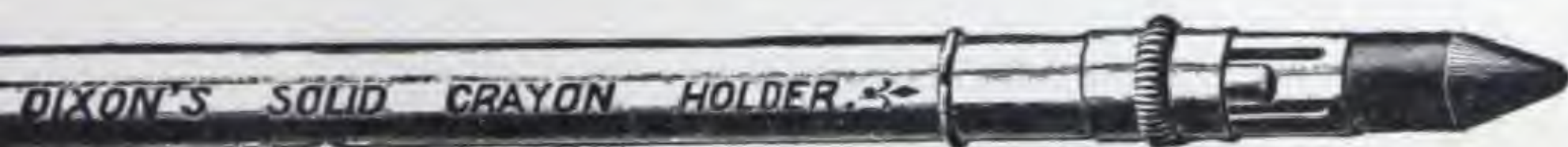
2915B Dixon's Lumber Crayon, blue, hexagon.....  
 2915R Dixon's Lumber Crayon, red, hexagon.....  
 2915W Dixon's Lumber Crayon, white, hexagon.....  
 2915Y Dixon's Lumber Crayon, yellow, hexagon.....  
 2915D Dixon's Lumber Crayon, black, hexagon, extra soft.....  
 2915E Dixon's Lumber Crayon Holders for above.....



2917B

PER DOZ.

2917B Dixon's "BEST" Solid Crayons, blue, round.....  
 2917T Dixon's "BEST" Solid Crayons, terra cotta, round.....  
 2917G Dixon's "BEST" Solid Crayons, green, round.....  
 2917A Dixon's "BEST" Solid Crayons, black, round.....  
 2917Y Dixon's "BEST" Solid Crayons, yellow, round.....  
 2917R Dixon's "BEST" Solid Crayons, red, round.....  
 2917C Dixon's "BEST" Solid Crayons, brown, round.....  
 2917V Dixon's "BEST" Solid Crayons, violet, round.....  
 2917P Dixon's "BEST" Solid Crayons, pink, round.....  
 2917O Dixon's "BEST" Solid Crayons, orange, round.....  
 2917S Dixon's "BEST" Solid Crayons, sepia, round.....  
 2917W Dixon's "BEST" Solid Crayons, white, round.....



2917H

PER DOZ.

2917H Dixon's Solid Crayon Holder, nickel-plated, 6½ inches, for  
crayons Nos. 2917B—2917W.....

## RED CHALK (Keel)

PER LB.

2918 Red Chalk (Keel) in fingers (chunks).....

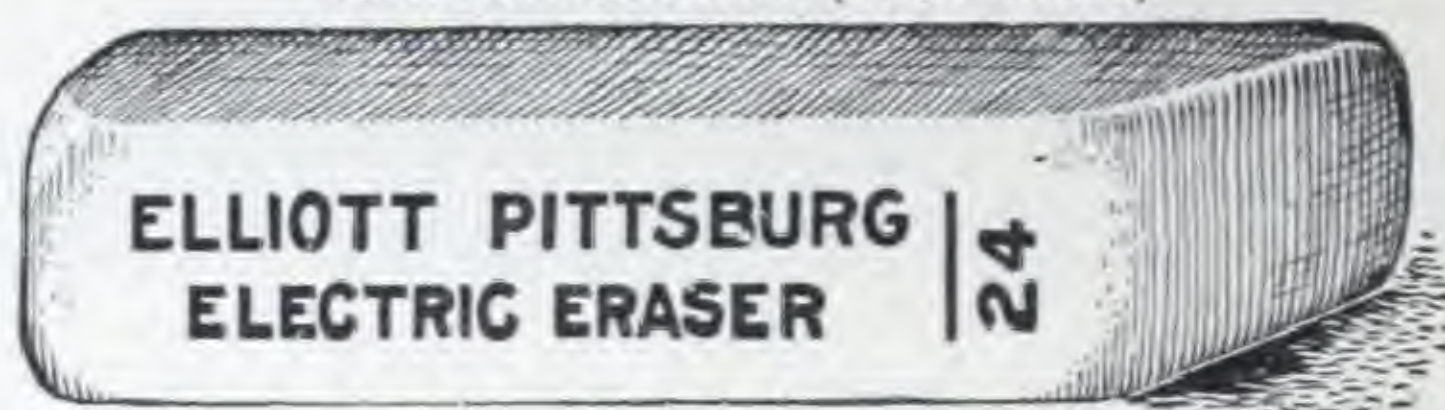
## METAL WORKERS' CRAYON

2916 Metal Workers' Crayon, 5 inches, flat.....



### PENCIL ERASERS

RED OR GREEN (Four Sizes)



2929G

The Electric Eraser is without question the finest pencil eraser made. Does not smutch. The erasing qualities are unapproached by any other pencil eraser.

- |       |  | PER LB. | EACH |
|-------|--|---------|------|
| 2927G | Electric, green, 48 pieces to the lb., in lb. boxes..... |         |      |
| 2928G | Electric, green, 36 pieces to the lb., in lb. boxes..... |         |      |
| 2929G | Electric, green, 24 pieces to the lb., in lb. boxes..... |         |      |
| 2930G | Electric, green, 12 pieces to the lb., in lb. boxes..... |         |      |
| 2927R | Electric, red, 48 pieces to the lb., in lb. boxes.....   |         |      |
| 2928R | Electric, red, 36 pieces to the lb., in lb. boxes.....   |         |      |
| 2929R | Electric, red, 24 pieces to the lb., in lb. boxes.....   |         |      |
| 2930R | Electric, red, 12 pieces to the lb., in lb. boxes.....   |         |      |

### ELECTRIC DOUBLE BEVEL PENCIL ERASERS



- |      |                                  | PER DOZ. |
|------|----------------------------------|----------|
| 2931 | Electric Red Pencil Erasers..... |          |



- |      |                                  | PER DOZ. |
|------|----------------------------------|----------|
| 2932 | Electric Red Pencil Erasers..... |          |



- |       |  | PER DOZ. |
|-------|--|----------|
| 2941A | E. Faber's "Ruby" Eraser, red, small.....    |          |
| 2941B | E. Faber's "Ruby" Eraser, red, large.....    |          |
| 2942A | E. Faber's Emerald Eraser, green, small..... |          |
| 2942B | E. Faber's Emerald Eraser, green, large..... |          |



PENCIL ERASERS—Continued.



2943 E. Faber's "Union" Pencil and Ink Eraser..... PER DOZ. EACH



2944S	E. Faber's Kneaded Rubber, small.	Per box of 36	2945	EACH
2944L	E. Faber's Kneaded Rubber, large.	Per box of 12		
2945	A. W. Faber's Artists' Rubber.			EACH
	Pieces to the box	40 30 24 20 16 12 8		4
	Per piece.....			
	Per box.....			

(The numbers indicate the quantity to the pound.)

ELICO PLIABLE RUBBER



2940

PER DOZ.

2940 Ellico Pliable Eraser.....  
 The Ellico Pliable Eraser is soft, and will be found invaluable for cleaning drawings, engravings, crayons, etc., without injury to either tracing paper or any other delicate drawing material.



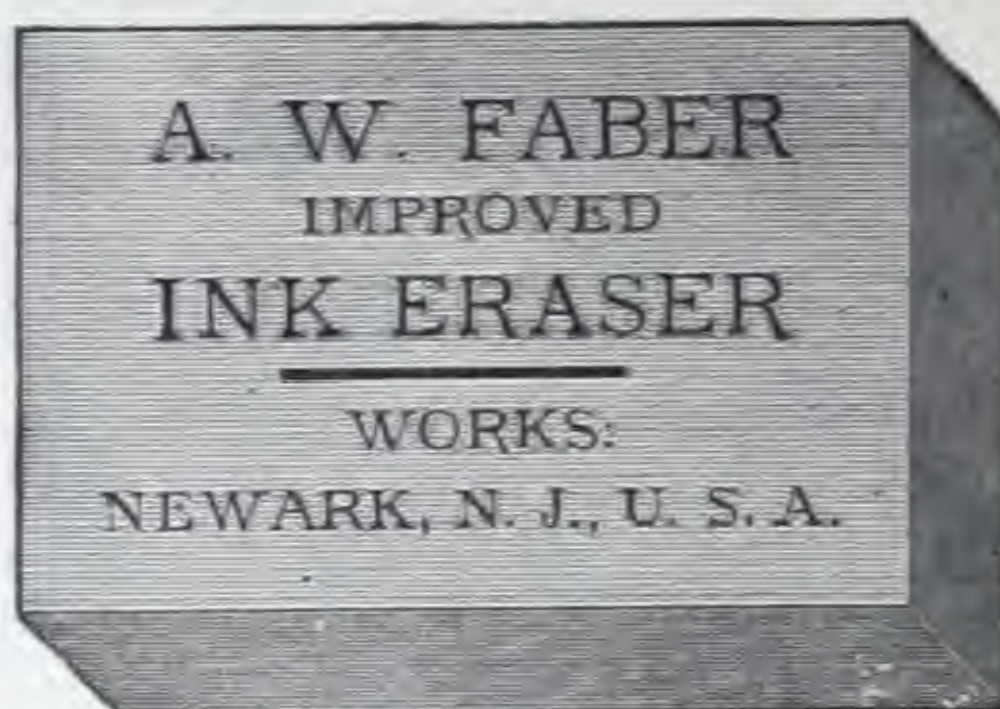
## INK ERASERS



2946

2946 A. W. Faber's Ink Erasers, small.....

2947 A. W. Faber's Ink Erasers, large.....

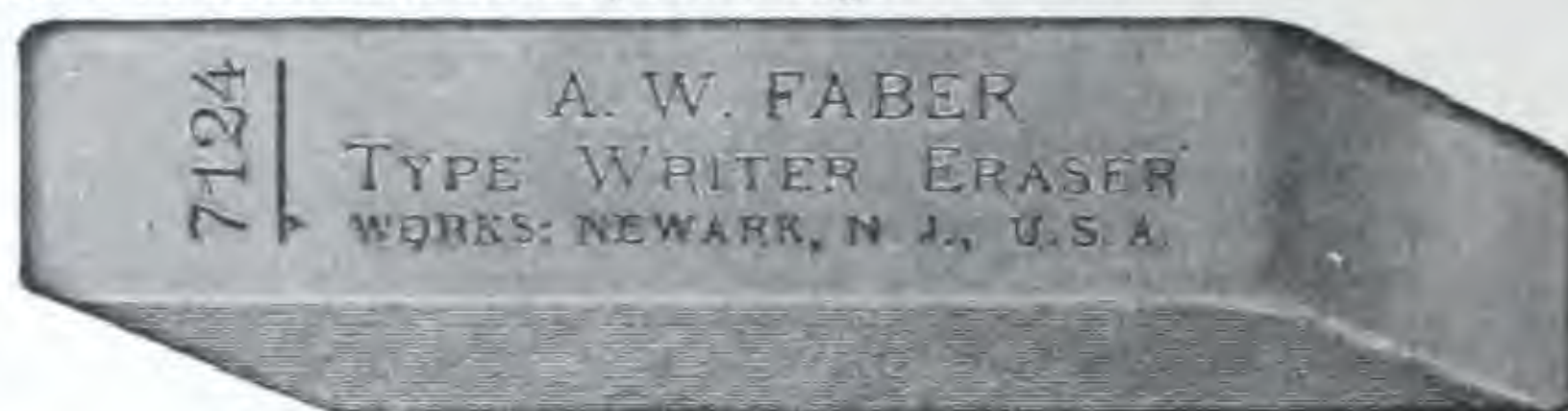


2947

PER 100 EACH

PER DOZ. EACH

2948 A. W. Faber's Ink Eraser, extra large.....



2951

PER DOZ. EACH

2950 A. W. Faber's "Typewriter" Eraser, small.....

2951 A. W. Faber's "Typewriter" Eraser, large.....



2951½

2951½ E. Faber's "Ruby" Pencil Eraser, circular.....



2952

PER DOZ. EACH

2952 E. Faber's "Circular" Ink Eraser.....

2953 E. Faber's Delta Ink Eraser, same as 2952, triangular shape.....



## ERASERS—Continued.



2954



2954 1/2

PER DOZ. EACH

- 2954 Weldons Triply Circular Ink Eraser.....  
 2954 1/2 Dixon's Circular Typewriter Eraser.....



2955

PER DOZ. EACH

- 2955 Van Dyke Soft Ink Eraser, red, double bevel, large size.

The most efficient ink eraser ever manufactured, especially adapted for the use of Draughtsmen on tracing cloth. The "Van Dyke" will make from three to five erasures on the same spot of a tracing and leave the surface of the tracing cloth unimpaired for remarking and the ink will not blot or spread.



### SPONGE RUBBER FOR CLEANING DRAWINGS



2958

EACH

- 2958 Sponge Rubber, with solid back,  $2\frac{1}{2} \times 1\frac{3}{4} \times \frac{5}{8}$  inch.....  
 2959 Sponge Rubber, with plain back,  $1 \times 1 \times 1$  inch.....  
 2960 Sponge Rubber, with plain back,  $4 \times 2 \times 1$  inch.....  
 2961 Sponge Rubber, with plain back,  $6 \times 4 \times 1$  inch.....

Nos. 2958—2961 Sponge Rubbers are best adapted for cleaning drawings, etc., without disturbing drawn lines, figures or surface of paper.

### ART GUM



2962C

For cleaning engravings, drawings, paintings, books and papers. Is soft and pliable and entirely free from grit. It wears itself away, but does not mar or scratch the surface of the paper.

PER DOZ. EACH

- 2962C Art Gum,  $2\frac{1}{4} \times 1\frac{1}{8} \times 1\frac{1}{8}$  inches.....  
 2962D Art Gum,  $3 \times 2 \times 1$  inches.....  
 2962E Art Gum,  $3 \times 3 \times 2$  inches.....

### "BEEGEE" INK ERASER



2963

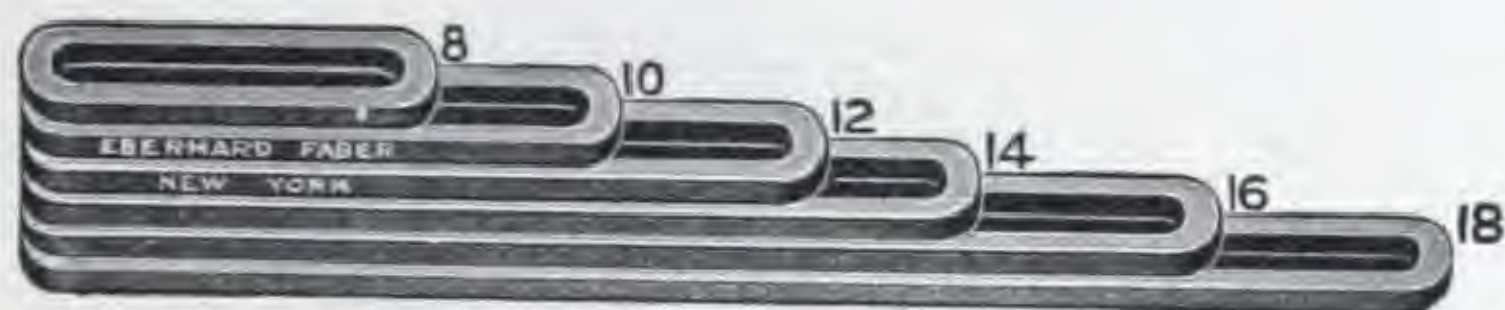
The "Beegee" Ink Eraser is an article of novel construction, the erasing portion being made of fine spun glass, having the appearance of white bristle. It is very efficient, and specially adapted for erasures on tracing cloth.

EACH

- 2963 Beegee Ink Eraser, complete, with filler.....  
 2964 Refills for Beegee Ink Eraser.....



## GRAY RUBBER BANDS

2965-8 to 2965-18  $\frac{1}{16}$  inch wide

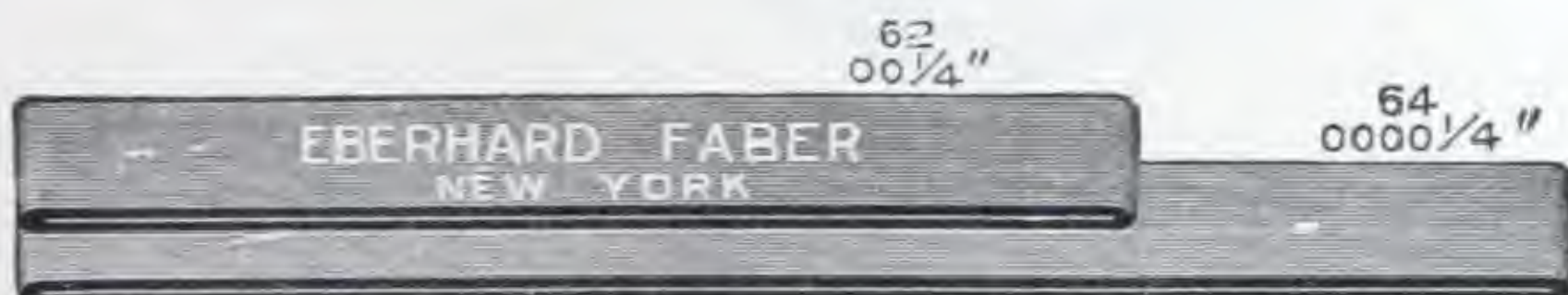
PER GROSS

- 65 No. 8 Gray Rubber Bands,  $\frac{7}{8}$  inches long.....  
 65 No. 10 Gray Rubber Bands,  $1\frac{1}{4}$  inches long.....  
 65 No. 12 Gray Rubber Bands,  $1\frac{5}{8}$  inches long.....  
 65 No. 14 Gray Rubber Bands, 2 inches long.....  
 65 No. 16 Gray Rubber Bands,  $2\frac{1}{2}$  inches long.....  
 65 No. 18 Gray Rubber Bands, 3 inches long.....

2967-30 to 2967-33  $\frac{1}{8}$  inch wide

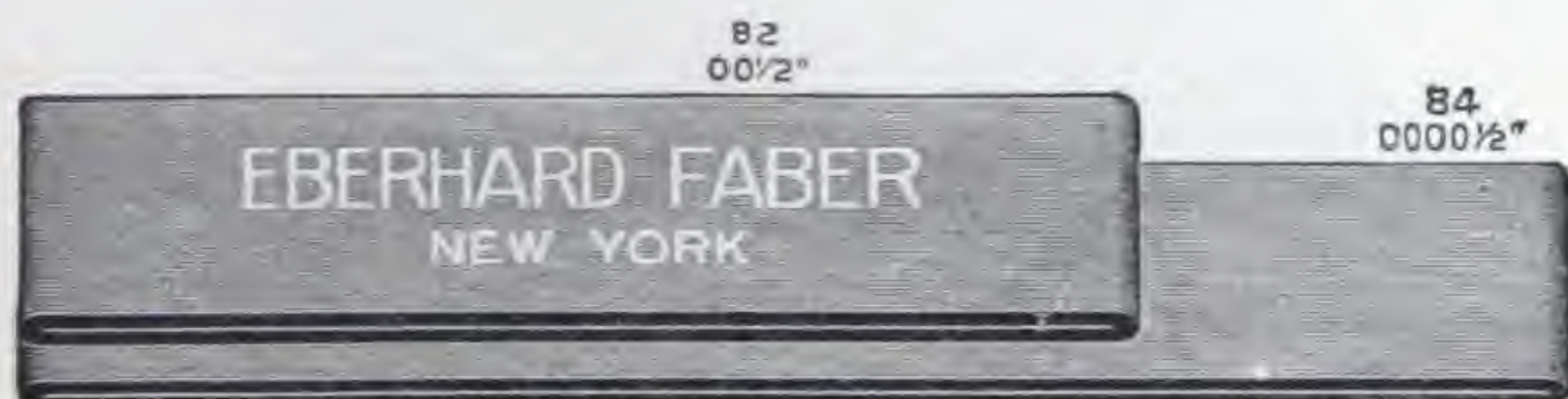
PER GROSS

- 67 No. 30 Gray Rubber Bands, 2 inches long.....  
 67 No. 31 Gray Rubber Bands,  $2\frac{1}{2}$  inches long.....  
 67 No. 32 Gray Rubber Bands, 3 inches long.....  
 67 No. 33 Gray Rubber Bands,  $3\frac{1}{2}$  inches long.....

2968-62 to 2968-64  $\frac{1}{4}$  inch wide

PER GROSS

- 68 No. 62,  $\frac{1}{4}$  inch wide x  $2\frac{1}{2}$  inches long.....  
 68 No. 64,  $\frac{1}{4}$  inch wide x  $3\frac{1}{2}$  inches long.....

2969-82 to 2969-84  $\frac{1}{2}$  inch wide

PER HALF GROSS

- 69 No. 82,  $\frac{1}{2}$  inch wide x  $2\frac{1}{2}$  inches long.....  
 69 No. 84,  $\frac{1}{2}$  inch wide x  $3\frac{1}{2}$  inches long.....



## GRAY RUBBER BANDS, ASSORTED SETS



2971A

EACH

2971A Grey Rubber Bands, 1 gross assorted sizes. . . . .



2971B

EACH

2971B Grey Rubber Bands, 1 gross assorted sizes. . . . .



2971C

EACH

2971C Grey Rubber Bands, 1 gross cabinet assortment. . . . .



## RUBBER BANDS—Continued.

**"RUBY" RUBBER BANDS**  
SPECIAL ASSORTMENTS



2971E

EACH

- 2971D No. 680 Ruby Rubber Band Assortment, medium size, box contains an assortment of popular sizes. ....
- 2971E No. 690 Ruby Rubber Band Assortment, medium large size, box contains a variety of sizes. ....



2971F

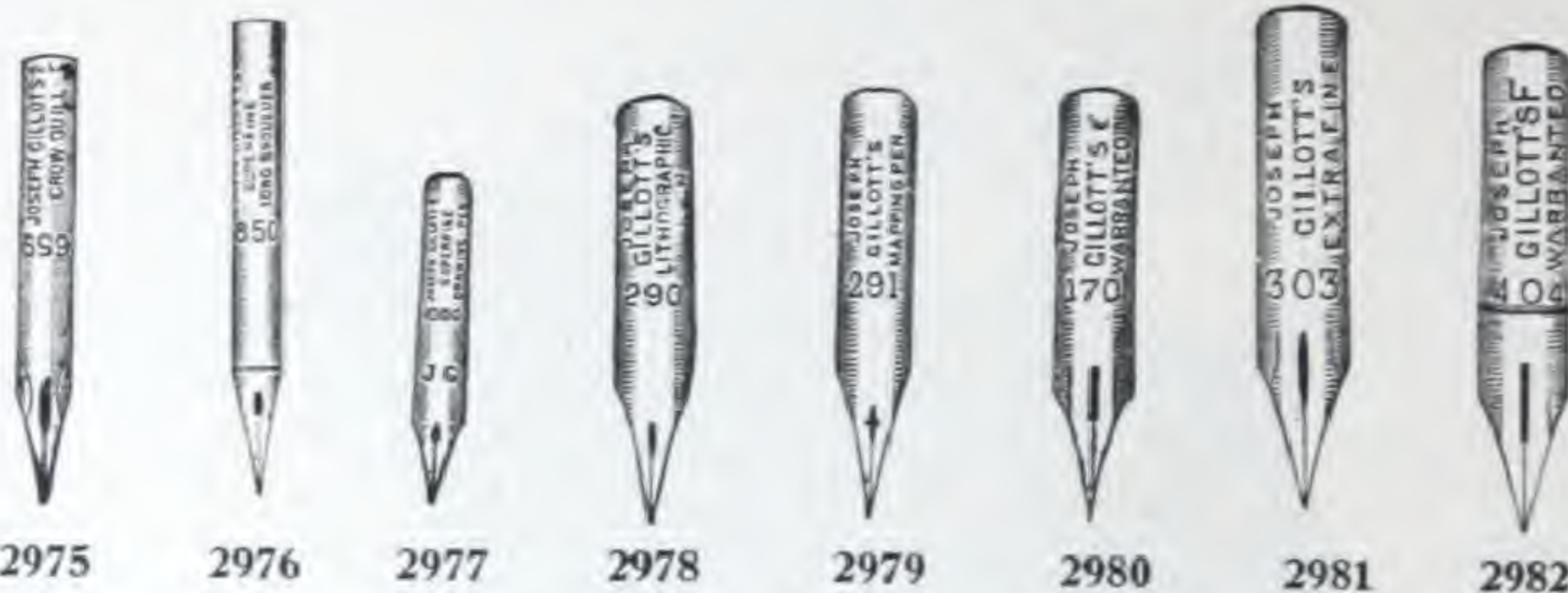
EACH

- 2971F No. 695 Ruby Rubber Band Assortment, large size, box contains a large assortment of various sizes. ....



## STEEL PENS

### FOR LETTERING AND DRAWING



- 2975 Gillott's Crow Quill Pens (659), on cards, with holder.  
 2976 Gillott's Crow Quill Pens (850), long shoulder, on cards,  
 2977 Gillott's Drawing Pens (1000), superfine, on cards.....  
 2978 Gillott's Lithographic Pens (290), on cards, with holder,  
 2978½ Gillott's Lithographing Pens (290), loose, in gross boxes,  
 2979 Gillott's Mapping Pens (291), on cards, with holder...  
 2979½ Gillott's Mapping Pens (291), loose, in gross boxes....  
 2980 Gillott's Mapping Pens (170), loose, in gross boxes....  
 2981 Gillott's Mapping Pens (303), loose, in gross boxes....  
 2982 Gillott's Mapping Pens (404), loose, in gross boxes....  
 2983 French Crow Quill Pens, on cards, with holders.....

PER  
DOZ.      PER  
GROSS



2984

PER  
EACH CARD

- 2984 Crow Quill Pen, with improved holder, having cork  
fingerpiece, 12 pens on card, each with holder.....

## PENHOLDERS



2985

PER  
EACH DOZ.

- 2985 Penholder, ebony, for crow quills, 659 and 850.....



2986

PER  
EACH DOZ.

- 2986 Penholder, spiral cedar, steel tip, for pens Nos. 170, 290,  
and 291.....



### ROAD PENS



2987

PER 1/4 GROSS PER DOZ.

7 Road Pens, Nos. 40 and 50.....  
These pens have two fine equal points and are used as road pens in map  
wing.

### LEONHARDT'S BALL POINTED PENS



2989F



2989EF



2990F



2990EF

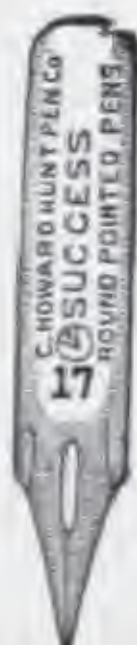
PER GROSS

9F Leonhardt's Ball Pointed Pens (506F).....  
9EF Leonhardt's Ball Pointed Pens (506EF).....  
0F Leonhardt's Ball Pointed Pens (516F).....  
0EF Leonhardt's Ball Pointed Pens (516EF).....

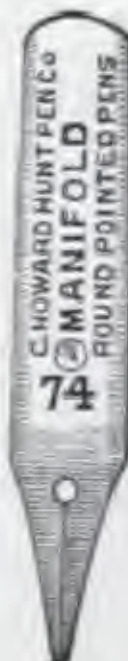
### HUNT'S STEEL PENS



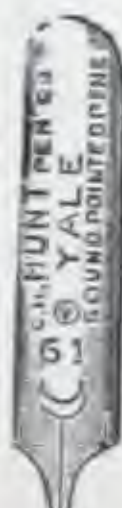
67



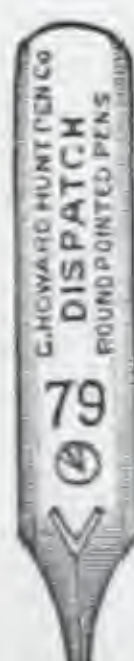
17



74



61



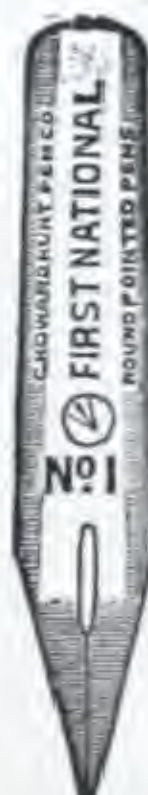
79



65



97



1

2996

PER GROSS

Hunt's Steel Pens, any one number.....



## ELLIOTT LETTERING AND RULING PEN

PATENTED



2997

This pen is especially designed to meet the requirements of draftsmen who do considerable lettering, and at the same time it performs the functions of an ordinary ruling pen. Separate pens for each width of line are unnecessary with this pen as the width of line is secured by operating the adjusting screw, same as in an ordinary ruling pen. For quick and neat lettering, this pen surpasses any other on the market, and they are commanding a large sale.

EACH

2997 Elliott Lettering and Ruling Pen, spring blade.....

The  
any reco  
is a com  
fourteen

Eng  
etc., in r  
other me

In o  
strictly  
with res  
2998 1/2



2998 S

2999 S

1



# Round Writing

The Hunt system of ornamental writing, called round writing, needs hardly any recommendation on our part. The Methodical Text Book for self-instruction is a complete guide for acquiring this beautiful hand in a very short time (ten to fifteen lessons suffice for a complete course in schools).

Engineers, architects and draftsmen are enabled to letter drawings, maps, &c., in round writing more elegantly and in considerably less time than by any other method.

In order to learn round writing it is indispensable to thoroughly study and carefully observe the directions given in the Methodical Text Book, especially with respect to the holding of the pen and to the exercises in writing.

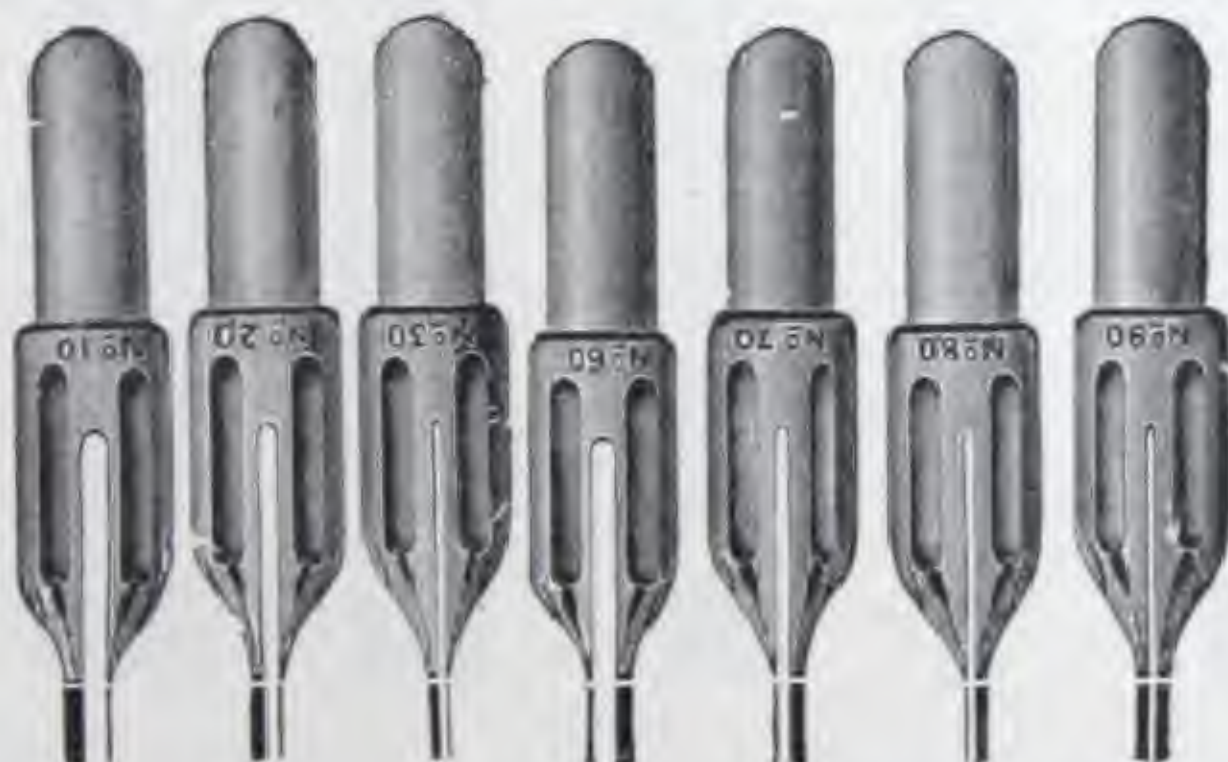
8½ Methodical Text Book to round writing.....



2998

PER DOZ.

- 98 Single Pointed Pens, Nos. 1, 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6.  
Per dozen.....
- 99 Single Pointed Pens, Nos. 1, 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6.  
Per gross of any one number.....



3000

- 00 Double Pointed Pens, Nos. 10, 20, 30, 40, 50, 60, 70, 80, 90.  
Any one number per dozen.....  
(Each gross contains pens of one number only)



## HUNT'S ROUND-WRITING PENS



3001, with holder attached

3001 Ink Holder, for single-pointed pens, especially for writing with India or Autograph Ink, per box of 10.....

EACH

## AUTOMATIC SHADING PENS

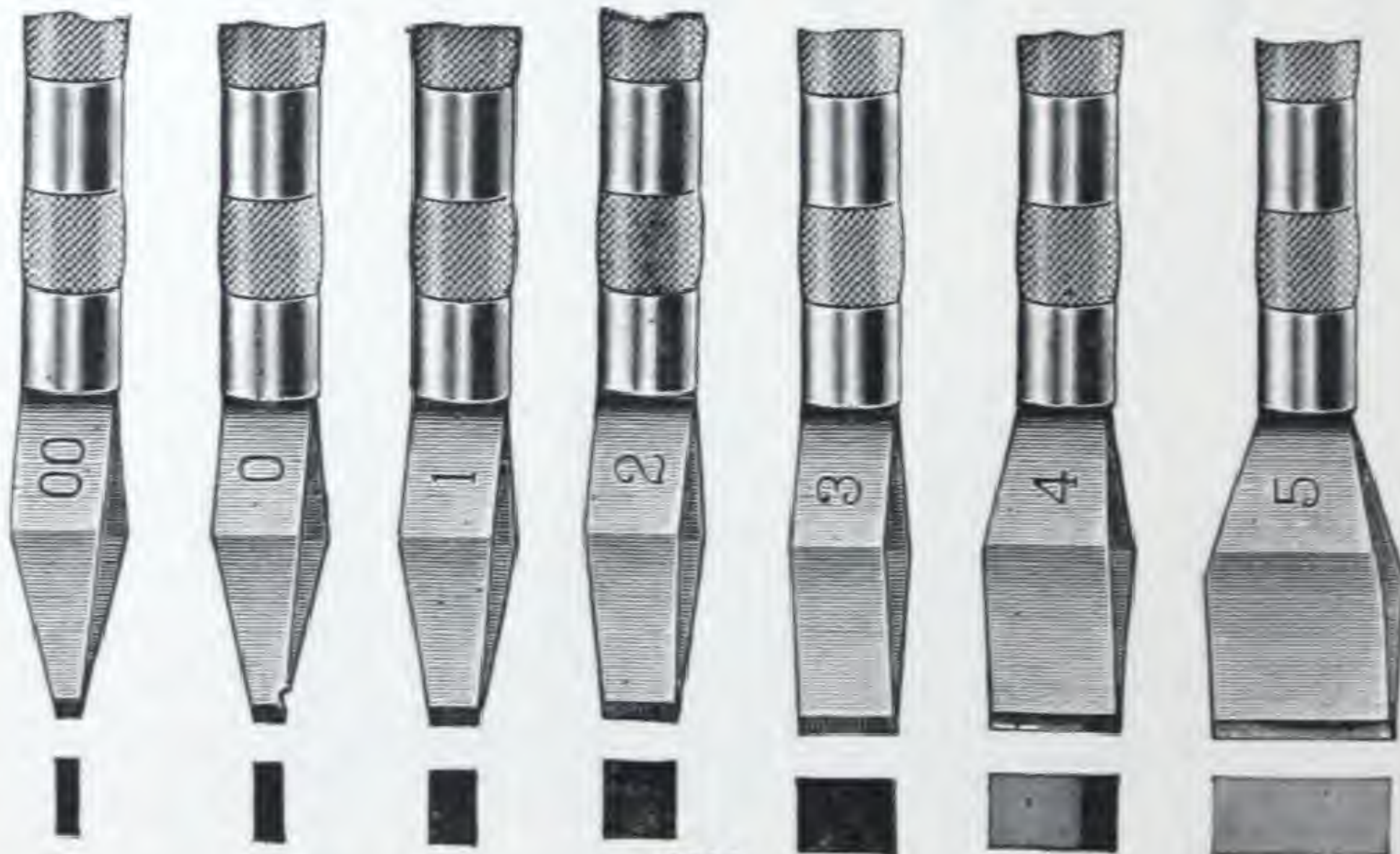


3001 1/2

EACH

3001 1/2 Automatic Shading Pens, Nos. .... 0 1 2 3 4 5  
Width of Nib, inches. .... 1/16 1/8 3/16 1/4 3/8 1/2

## AUTOMATIC MARKING PENS



3002

EACH

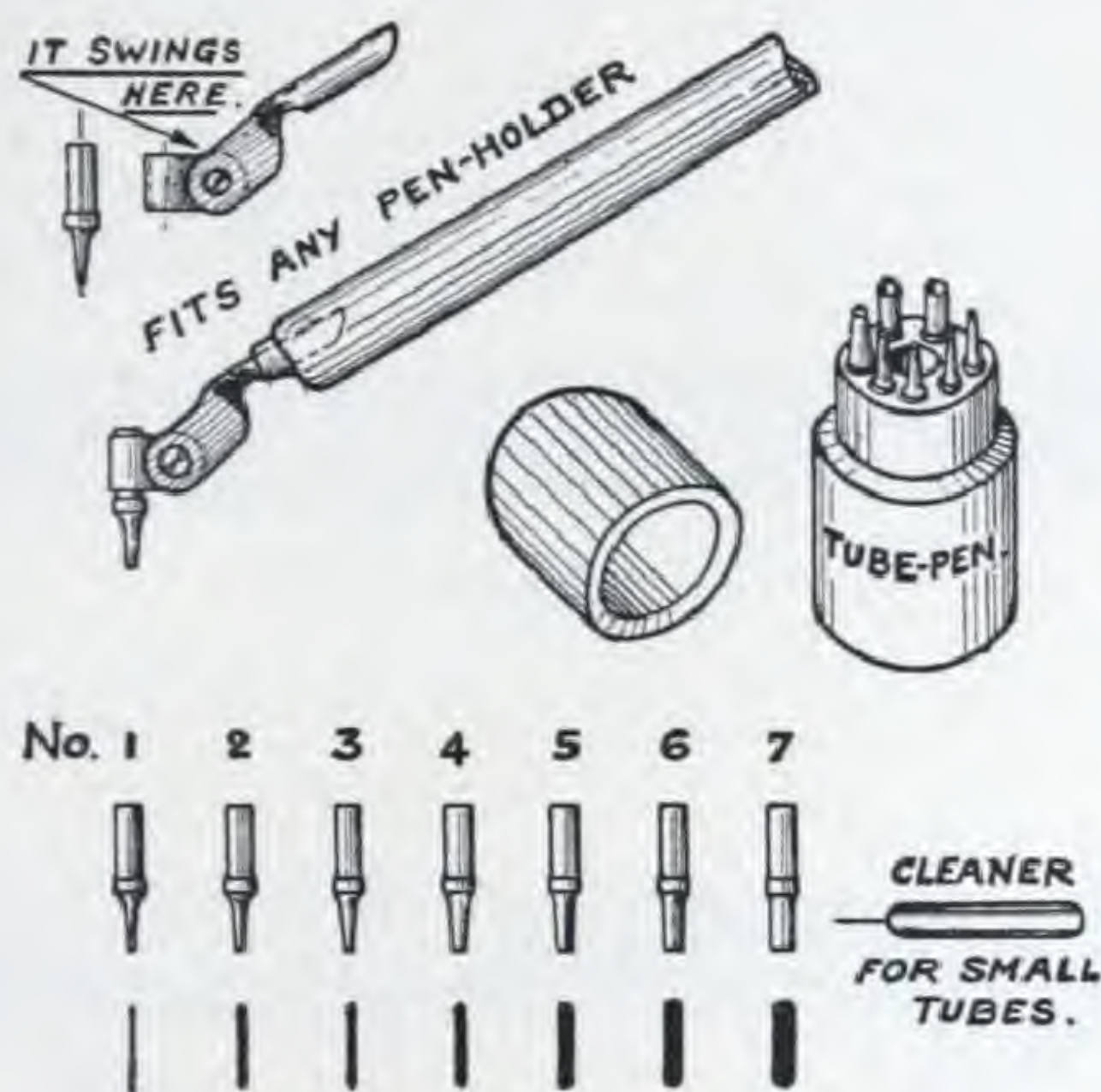
3002 Automatic Marking Pens, Nos. .... 00 0 1 2 3 4 5  
Width of Nib, inches. .... 1/16 3/32 1/8 3/16 1/4 3/8 1/2

3002A Shading and Marking Pen Ink in colors as follows: PER 1-OZ. BOTTLE  
Black, purple, brown, crimson, green, blue, yellow.....

3002B Instruction Book for the use of Automatic Shading Pens..... PER COPY



## THE LETTERING TUBE PEN



The Tube Pen enables the draftsman to letter drawings perfectly with minimum effort. It gives satisfaction to users, because it produces results which are neat, clean and uniform.

Splendid blue prints are obtained from originals made with the Tube Pen.

Here is the Pen for India Ink answering a long felt want. Its place is beside your set of Drawing Tools.

There are seven points, of the widths as shown. Each point constitutes a miniature ink well, feeding downward to the working surface.

These pens are interchangeable. They fit into a swivel socket. This part in turn fits an ordinary penholder. A proper working angle is secured and maintained by an adjusting screw.

EACH

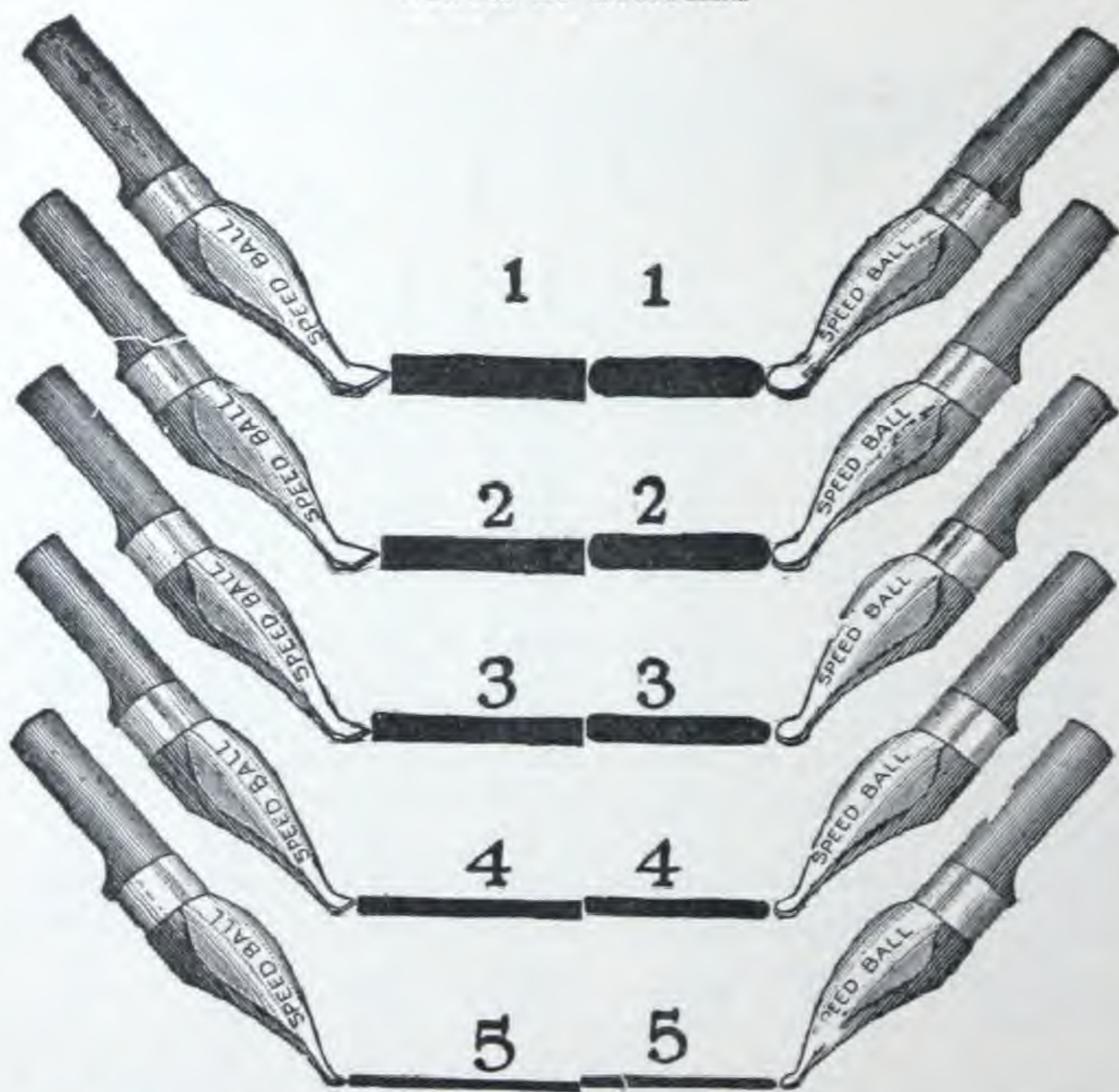
004 Lettering Tube Pen of seven points, cleaner, and holder, in small compact wooden box.....



### SPEEDBALL LETTERING PENS

The Speedball is the fastest and most easily operated broad-stroke pen known. It produces a stroke of uniform width throughout when drawn in any direction—up-strokes, down-strokes or laterals. Square terminals with "Style A" and round terminals with "Style B". The ink flow is under automatic control by double reservoir fountain and tip-retainer over the extreme point of bent up section which forms the marking point. This is an exclusive patent feature of the Speedball and prevents any excess flood of ink or color on the strokes, which is most liable to occur in broad-stroke pens of a like character, minus this most important auxiliary. It is unnecessary to use a dropper, quill or stick to fill the reservoir. Simply dip in the ink like an ordinary pen. They will work in any India Ink or opaque water color properly diluted to flowing consistency. The small sizes retain enough ink to make an entire alphabet.

#### WIDTH OF STROKES



3005A	Speedball Lettering Pens Style A.....	PER SET
3005B	Speedball Lettering Pens Style B.....	
3005C	Speedball Lettering Book.....	EACH



## PENHOLDERS



3006

PER DOZ. EACH

- 006 Natural polish, hard rubber tip, small.....  
 007 Natural polish, hard rubber tip, medium.....  
 008 Natural polish, hard rubber tip, large.....



3009

PER DOZ. EACH

- 009 Fluted, soft white rubber tip, natural polished, taper  
 cedar handle.....



3010

PER DOZ. EACH

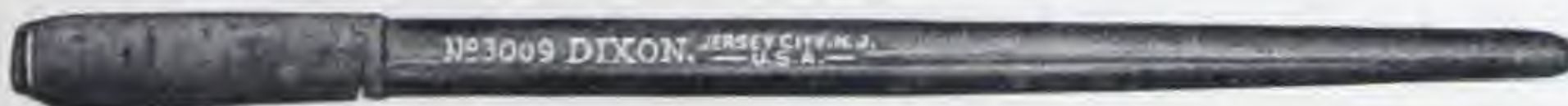
- 010 Taper handles, fluted soft rubber, pen-ejecting tips....



3011

PER DOZ. EACH

- 011 Cedar finish, medium taper, hard rubber tip.....



3012

PER DOZ. EACH

- 012 Taper cork tip, natural finish.....



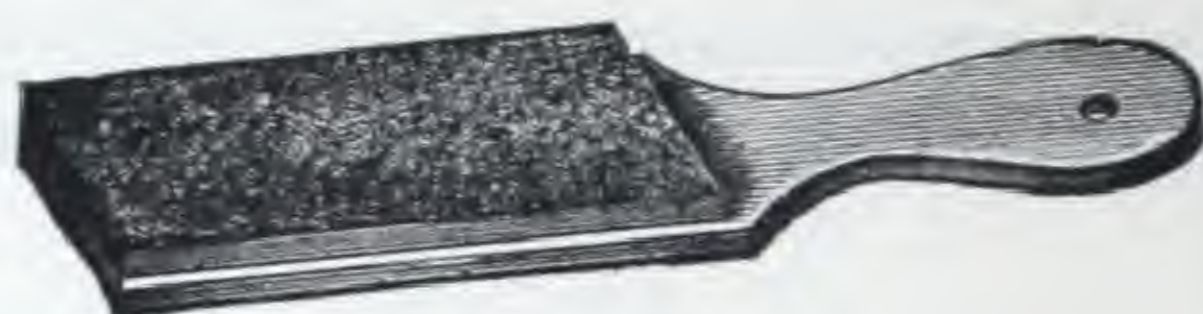
3013

PER DOZ. EACH

- 013 Taper, natural finish.....



## PENCIL POINTERS



3014

These pencil pointers consist of sheets of flint paper made into a block.

EACH

- 3014 Pencil Pointer,  $1\frac{1}{4}$  x 6 inches, with handle.....  
 3015 Pencil Pointer,  $1\frac{1}{4}$  x 4 inches, without handle.....  
 3016 Pencil Pointer, like No. 3014, but of emery paper,  $1\frac{1}{4}$  x 6 inches..

## LEAD PENCIL FILE



3017

EACH

- 3017 Lead Pencil File and Tack Lifter, 6 inches.....

## STEEL ERASERS



3018A

EACH

- 3018A Steel Eraser, with long blade, bone handle, Domestic.....  
 3018B Steel Eraser, with long blade, bone handle, Rodgers.....  
 3018C Steel Eraser, with long blade, coco handle, Domestic.....  
 3018D Steel Eraser, with long blade, coco handle, Rodgers.....



3019A

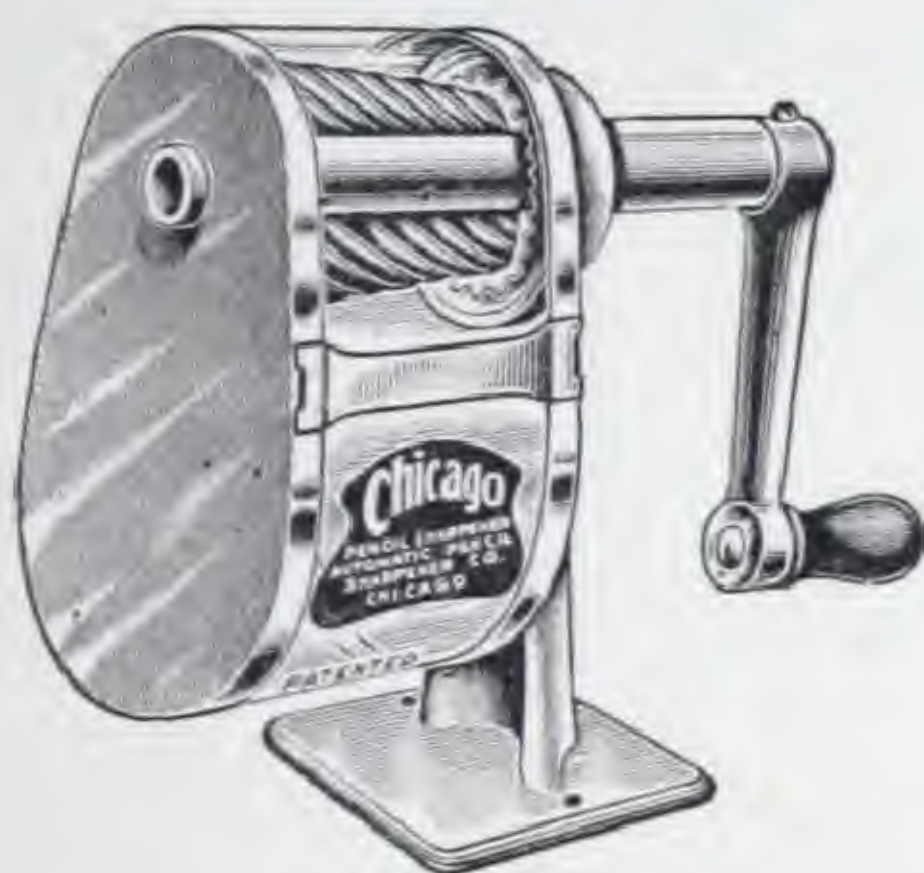
EACH

- 3019A Steel Eraser, with short blade, bone handle, Domestic.....  
 3019B Steel Eraser, with short blade, bone handle, Rodgers.....  
 3019C Steel Eraser, with short blade, coco handle, Domestic.....  
 3019D Steel Eraser, with short blade, coco handle, Rodgers.....



## PENCIL SHARPENERS—Continued.

## CHICAGO PENCIL SHARPENERS



$\frac{1}{2}$  Actual Size  
3020C



$\frac{1}{2}$  Actual Size  
3020D

EACH

**3020C** This model is the best low priced sharpener on the market. It is equipped with twin Milling Cutters of solid steel. Cutter frame is cast from white metal, base nickel-plated. The machine will sharpen standard size pencils only and is fitted with stop which causes cutting to cease when point is produced....

**3020G** This model same as No. 3020C, but fitted with a device which allows the sharpening of crayon pencils also.....

**3020D** This model is the best hand feed sharpener that can be produced, and is equipped with twin Milling Cutters of solid steel. It sharpens all size pencils and is provided with a point adjuster which will produce any desired point from blunt to fine. Heavy steel frame nickel-plated.....

**3020H** Cutters for Models C, G, and D.....

**3020T** Draftman's Cutters for Model D.....

**3020H** Clamps for Models C, G, and D.....



## BATES' NUMBERING MACHINES



3021A

## Styles of Figures:

STYLE A	STYLE F	STYLE G
12345	12345	67890
STYLE C		STYLE L
67890		12345
STYLE E		STYLE M
67890		67890

## BATES' AUTOMATIC HAND NUMBERING MACHINES

Every figure disc changes automatically from one to the full numerical capacity of the machine. It has a dial setting movement and can be changed automatically from consecutive to duplicate and continuous numbering by moving the pointer in front of the dial. It is made of steel and weighs 16 ounces. Equipped with gauge plate which enables the operator to print an impression on any given line with exactness; is self-inking and all the working parts are inclosed and kept free from dust.

## NET PRICES

EACH

3021A	4-Wheel, numbers 1 to 9,999
3021B	5-Wheel, numbers 1 to 99,999
3021C	6-Wheel, numbers 1 to 999,999
3021D	7-Wheel, numbers 1 to 9,999,999
3021E	8-Wheel, in Style A only, numbers 1 to 99,999,999

## NEW 7-MOVEMENT BATES' NUMBERING MACHINE

Movements as follows: Consecutive, Duplicate, Triplicate, Quadruplicate, Sextuplicate, Twelve Times and Repeat.

EACH

3022A	4-Wheel, numbers 1 to 9,999
3022B	5-Wheel, numbers 1 to 99,999
3022C	6-Wheel, numbers 1 to 999,999
3022D	7-Wheel, numbers 1 to 9,999,999
3022E	8-Wheel, in Style A and C only, numbers 1 to 99,999,999

## BATES' NUMBERING MACHINE INK

Red or Copying, Red, Blue, Green, Black and Indelible.

3023	Bottle, $\frac{1}{2}$ ounce	EACH
------	-----------------------------	------



## EYE SHADES



3024



3025

EACH

- 3024 The Eureka Eye Shade. An adjustable Eye Shade, leatherette bound, transparent and very light in weight.....
- 3025 Featherweight Eye Shades, opaque or transparent.....

## SLEEVE PROTECTORS

EACH

- 3026 Sleeve Protectors, black, small, medium and large.....

## ERASING SHIELDS



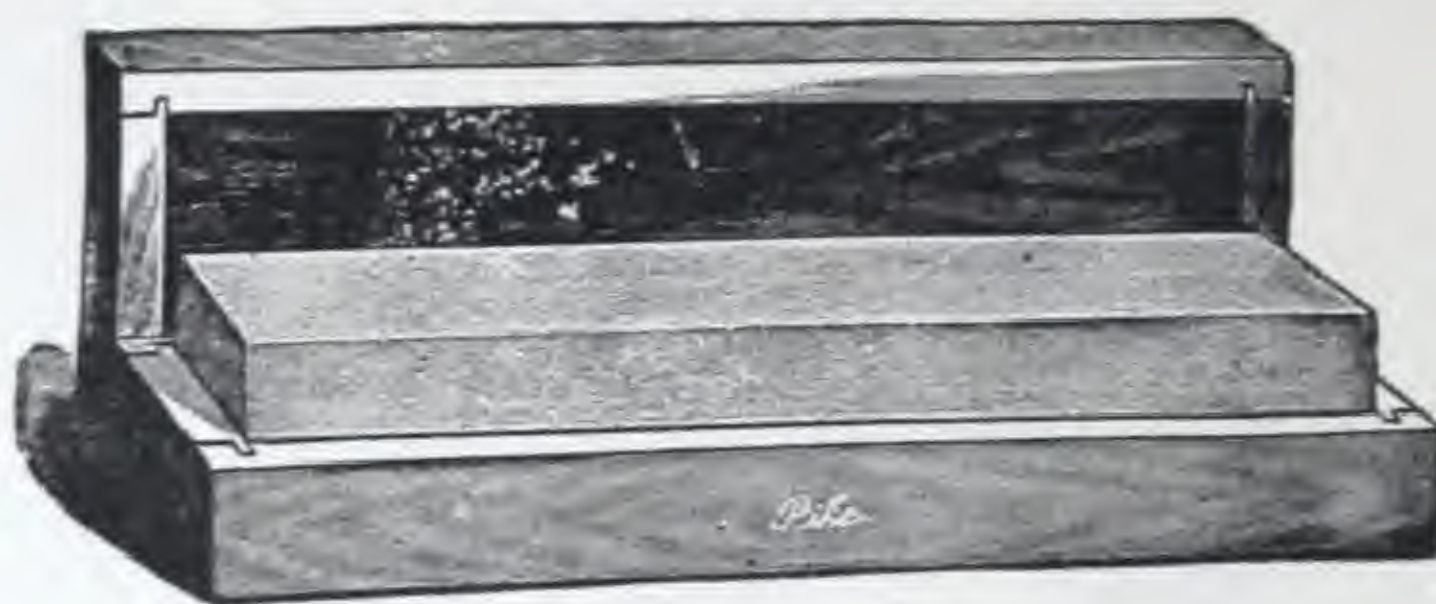
3027

EACH

- 3027 Nickel Plated Erasing Shield .....
- 3027A Transparent Celluloid Erasing Shield.....



## ARKANSAS OIL STONES



3028

- 3028 Arkansas Oil Stone, mounted in polished mahogany case, with cover.  
 Size, inches..... $3\frac{1}{2} \times 1$      $4 \times 1\frac{1}{2}$      $5 \times 2$   
 Each.....

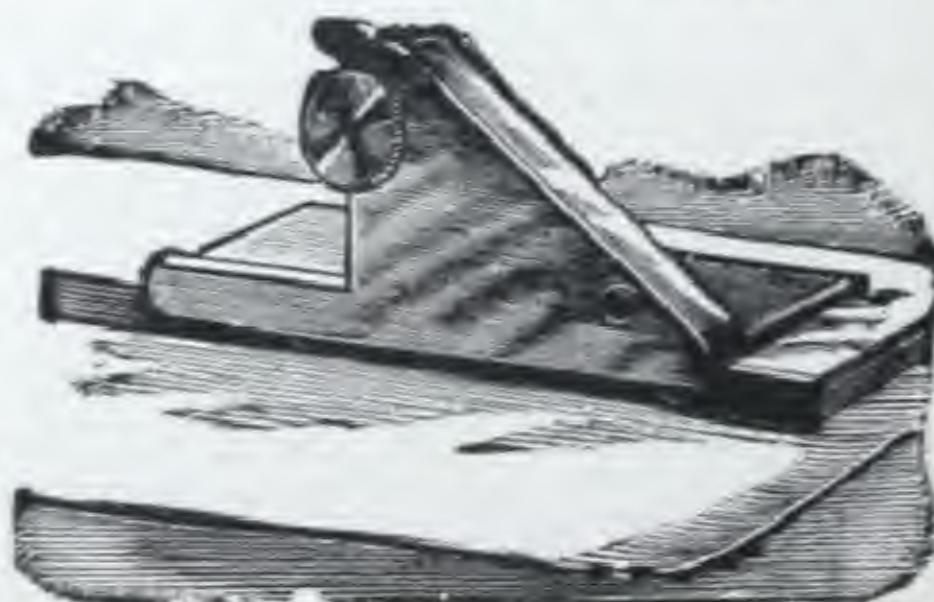


3029

EACH

- 3029 Arkansas Oil Stone, wedge shape slip, 3 to  $4\frac{1}{2}$  inches long,  $\frac{3}{4}$  to 1  
 inch wide,  $\frac{1}{8}$  to  $\frac{1}{4}$  inch thick.....

## PAPER CUTTERS



3030

EACH

- 3030 Handy Paper Cutter, brass.....  
 3030½ Handy Paper Cutter, nickel-plated.....

These instruments are used for cutting drawings from the board, also for cutting any kind of paper or bristol board. They can be slid along T-Square or straight edge without injuring its edge, and has a thumb screw adjustment which may be set so as to cut only the thickness of the paper, without marking the drawing board.

3031

3031½

3032

 3033A  
 3033B  
 3033C  
 3033D  
 3033E



## PAPER FASTENERS



3031

3031½

3031 Paper Fasteners, flat heads.

No.....	1	2	3	4
Length of shanks, inches.....	¼	½	¾	1
Per box of 100.....				

3031½ Paper Fasteners, round heads.

No.....	1	2	3	4
Length of shanks, inches.....	¼	½	¾	1
Per box of 100.....				

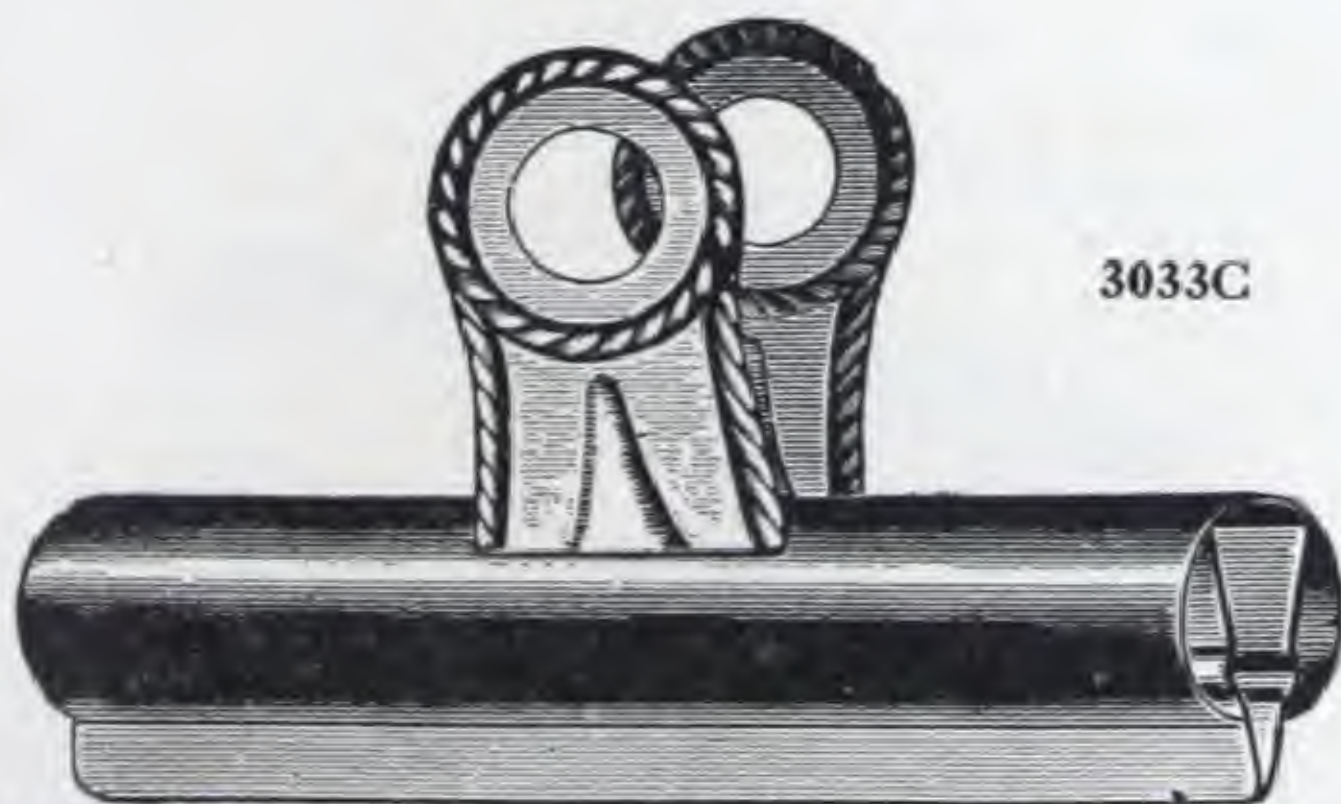


3032

PER BOX

3032 No. 1B, O. K. Paper Fasteners, 100 in a box.....

## CLIPS



3033C

PER DOZ.

303A	Steel Clips, 1¼ inches long.....	
303B	Steel Clips, 2¼ inches long.....	
303C	Steel Clips, 2½ inches long.....	
303D	Steel Clips, 3 inches long.....	
303E	Steel Clips, 5 inches long.....	



## STAPLE PRESS



3034A

EACH

- 3034 Staple Press, for binding.....  
 3034A Staple Press, for binding, with short arm.....  
 3034B Wire Staples, No. 1 or 2, per box of 1,000.....

## OFFICE PINS



3035

- 3035 Office Pins, pyramid.....EACH  
 3035½ Banker Office Pins, in ½-pound boxes.....PER LB.

## PAPER CLIPS



3036



3037

PER BOX

- 3036 Gem Paper Clips, 100 in a box.....  
 3037 Ideal Paper Clips, 100 in a box.....



3038

- 3038 The "Triumph" Eyelet Press and Punch is made of metal, nickel-plated, and is superior to any of its kind. The "gauge" is a new feature of great utility and all the obnoxious breakage of springs, etc., which continually occurs in other eyelet punches, is impossible in the "Triumph."  
 EACH

- 3038½ Eyelets.  
 In boxes of 250 SIZE B J. N. D. B. LONG D. B. SHORT

Ow  
 will flo  
 "Electri  
 The bla  
 inks on  
 The  
 The Wa  
 of unus  
 produce  
 so that  
 true an  
 proof w  
 We inv  
 and bel  
 of our p

3039  
 3039Y  
 3039O  
 3039S  
 3039C  
 3039B  
 3039G  
 3039VE  
 3039R  
 3039V  
 3039W  
 Sp



# ELLIOTT'S "ELECTRIC" WATERPROOF DRAWING INK FOR DRAFTSMEN AND ARTISTS



Flows Freely.

Positively

Dries Quickly.

Waterproof.

Full Size  
3039

Owing to the demand we have had for high grade Drawing Ink, which will flow very freely and is absolutely imperishable, we have prepared our "Electric" Drawing Ink and feel it will be found superior in richness and density. The black is a true one, not having the brownish cast so often apparent in other inks on the market.

The above cut shows our  $\frac{3}{4}$ -ounce bottle, which has a quill filler attached. The Waterproof Black Ink is made from the highest grade of pure carbon; is unsurpassed density, flows freely, dries quickly, and even the finest lines produced by it are absolutely opaque. It is perfectly waterproof when dry, so that color washes may be used safely over it. The Colored Inks are dense, true and brilliant. They can be used for lines or washes; are absolutely waterproof when dry, and can be mixed with each other to produce other shades. We invite a test by those who are not satisfied with the ink they are now using, and believe they will be more than pleased with the results secured by the use of our product.

 $\frac{3}{4}$  Oz.  $\frac{1}{2}$  Pt. Pt. Qt.

3039	Elliott's "Electric" Waterproof Black Ink...
3039Y	Elliott's "Electric" Waterproof Yellow Ink...
3039O	Elliott's "Electric" Waterproof Orange Ink...
3039S	Elliott's "Electric" Waterproof Scarlet Ink...
3039C	Elliott's "Electric" Waterproof Carmine Ink.
3039B	Elliott's "Electric" Waterproof Blue Ink.....
3039G	Elliott's "Electric" Waterproof Green Ink...
3039VB	Elliott's "Electric" Waterproof Brown Ink...
3039R	Elliott's "Electric" Waterproof Brick Red Ink
3039V	Elliott's "Electric" Waterproof Vermilion Ink
3039W	Elliott's "Electric" Waterproof Violet Ink...

Special prices will be quoted on dozen or gross lots of any of our inks.

For Ink Bottle Holders, see page 237



## HIGGINS' LIQUID DRAWING INKS



3040

3043

3044

 $\frac{3}{4}$  Oz.  $\frac{1}{2}$  Pt. Pt. Qt.

- 3040 Higgins' General Black Ink, Each.....  
 3041 Higgins' Waterproof Black Ink, Each.....  
 3042 Higgins' Colored Inks made in the following  
       colors: Blue, brick red, brown, carmine,  
       green, indigo, orange, scarlet, vermilion,  
       violet, yellow.....

In ordering No. 3042, please state color of Ink desired

2 Oz.  $\frac{1}{2}$  Pt. Pt. Qt.

- 3043 Higgins' Eternal Ink, Each.....  
 3044 Higgins' Engrossing Ink, Each.....

Special prices will be quoted on dozen or gross lots of any of our inks.

For Ink Bottle Holders, see page 237

3045 Alt

3046 Mo

3047

3047A

3047B

3047C



# INK BOTTLE HOLDERS



3045

- 45 Alteneder's Draftsman's Pen-filling Ink Stand, each.....



3046

- 6 Metal Ink Bottle Holders and Paper Weights for Electric and Higgins'  $\frac{3}{4}$ -ounce ink bottles. Single, each.....

## DRAWING INKSTAND



3047

- 7 Elliott's Drawing Inkstand, containing five  $\frac{3}{4}$ -ounce bottles of drawing ink (assorted to order)..... EACH
- 7A Elliott's Tray, without ink, 5 holes for  $\frac{3}{4}$ -ounce bottles.....
- 7B Elliott's Tray, without ink, 3 holes for  $\frac{3}{4}$ -ounce bottles.....
- 7C Elliott's Tray, without ink, 2 holes for  $\frac{3}{4}$ -ounce bottles.....



## STAFFORD'S WRITING FLUID



3048C



3048

## COMMERCIAL INK

"The Ink that Absorbs Moisture from the Air."

This characteristic of "Commercial" retards evaporation and thickening in the inkwell and causes it to flow freely after other inks have become too thick to use.

It writes a brilliant blue, and as it dries, **dyes** the paper, instead of, like other inks, merely leaving a faded mark on the surface. In a few hours it changes to a most intense and **permanent black**. It has very little action on steel pens and is absolutely free from sediment. It thickens less than any other ink.

No.	Size	EACH
3048	Quarts, with dripleess pour regulator.....	
3048A	Pints, with dripleess pour regulator.....	
3048B	Half Pts., with dripleess pour regulator.....	
3048C	2 Oz., Square, metal top corks .....	



## HIGGINS' ADHESIVES



3049



3050

3049 Higgins' Drawing Board Mucilage, in glass jars.

Size..... 3 Oz.

6 Oz.

14 Oz.

Each.....

3050 Higgins' Photo Mounter, in glass jars.

Size..... 3 Oz.

6 Oz.

14 Oz.

Each.....



3051



3052

3051 Higgins' Office Paste, in white glass, wide mouthed bottles, with enameled screw cap and improved brush.

Size..... 4 Oz. 8 Oz.

 $\frac{1}{2}$  GAL.

GAL. JARS

Each.....

3052 Higgins' Taurine Mucilage in bottles.

Size..... 2 Oz. 4 Oz.

 $\frac{1}{2}$  PT.

PT.

QT.

Each.....



## HIGGINS' ADHESIVES—Continued.



3054



3053

- 3053 Higgins' Vegetable Glue in tin cans.  
 Size.....  $\frac{1}{2}$  LB.      1 LB.      2 LBS.      5 LBS.  
 Each.....
- 3054 Sanford's Utopian Library Paste in glass jars with brush.  
 Size..... 5 Oz.      8 Oz.  
 Each.....
- 3055 Sanford's Utopian Library Paste in glass jars without brush.  
 Size..... PT.      QT.  
 Each.....



3056



3057

- 3056 Le Page's Glue in glass bottles.  
 Size..... 1 Oz.      2 Oz.  
 Each.....
- 3057 Le Page's Glue in patent tin cans.  
 Size.....  $\frac{1}{2}$  PT.      PT.      QT.  
 Each.....



## CHINESE OR INDIAN INK

Our Own Importation

Illustrations Full Size



B



C



D



E



G

## CHINESE OR INDIAN INK

EACH

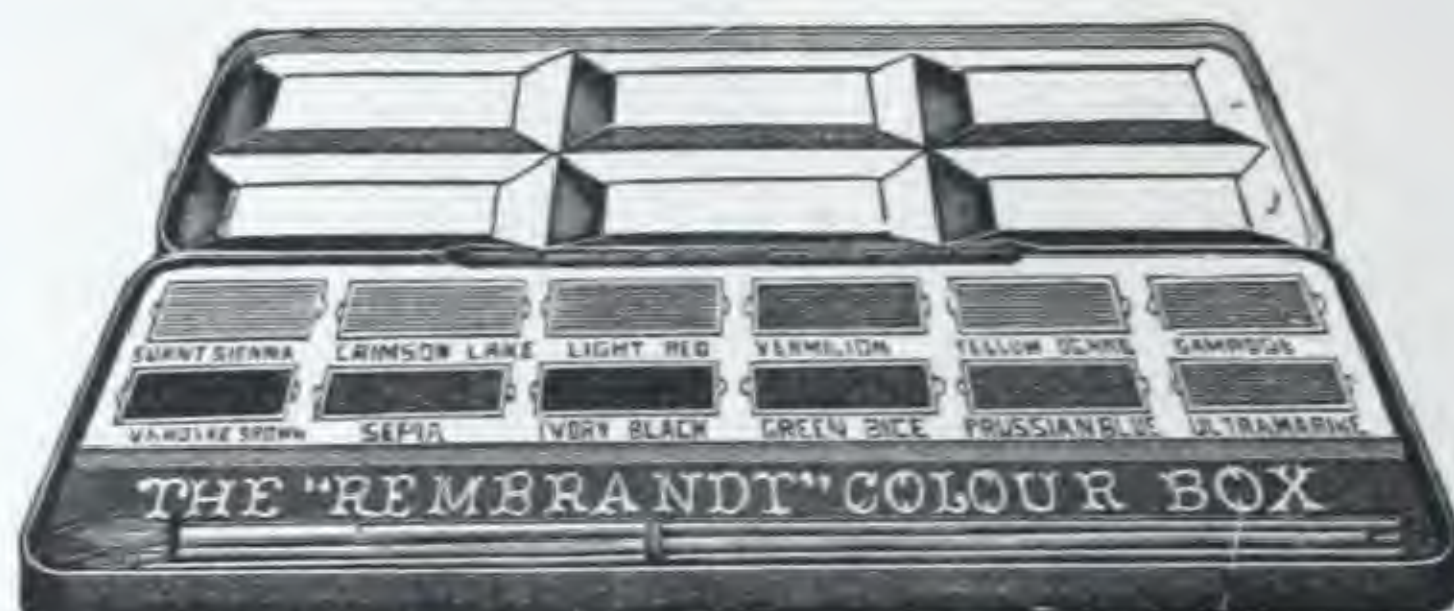
- 058A Oval Lion Head,  $2\frac{3}{8}$  inches long.....  
 058B Oval Lion Head,  $3\frac{1}{4}$  inches long.....  
 058C Square Super Super,  $2\frac{7}{8}$  inches long.....  
 058D Square Super Super,  $3\frac{5}{8}$  inches long.....  
 058E Oblong Gilt Figures,  $3\frac{1}{8}$  inches long, fine.....  
 058G Oblong Gilt Figures,  $3\frac{5}{8}$  inches long, extra fine.....

The most practical slabs for rubbing up the above inks uniformly and quickly  
 are our improved Slate Ink Slabs, No. 3099, with air-tight plate glass cover.



## FRENCH MOIST WATER COLORS IN JAPANNED TIN BOXES

### THE "REMBRANDT"



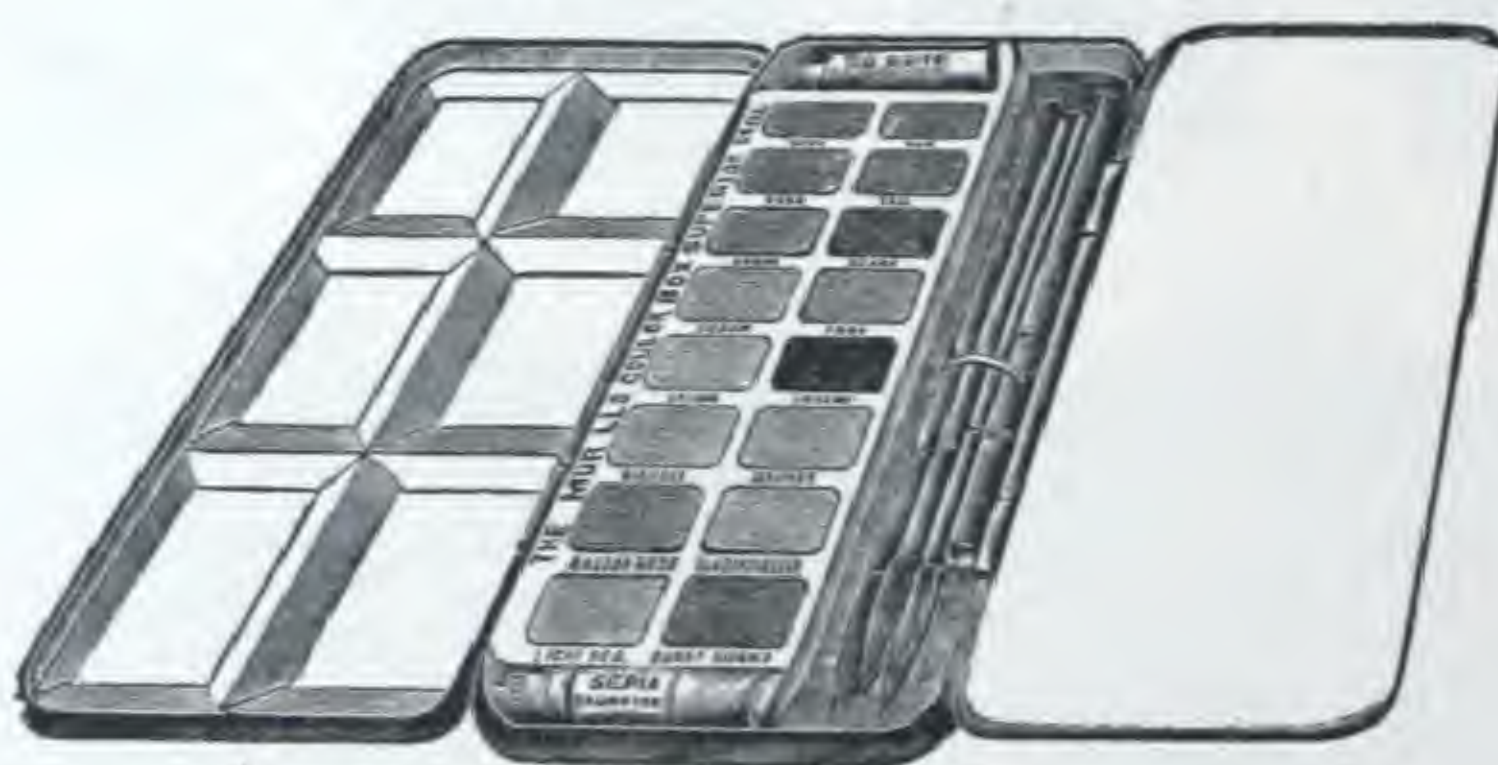
3060

EACH PER DOZ.

- 3059 The "Rembrandt" Box—Small, with 6 moist colors and brushes.....
- 3060 The "Rembrandt" Box—Large, with 12 moist colors and brushes.....

3063

### THE "MURILLO"



3062

EACH PER DOZ.

- 3061 The "Murillo" Box—Small,  $3\frac{1}{2} \times 6\frac{1}{2}$  inches, containing 12 moist colors, in pans, tubes of sepia and Chinese white, with brushes.....
- 3062 The "Murillo" Box—Large,  $3\frac{1}{2} \times 7\frac{1}{2}$  inches, containing 16 moist colors, in pans, Chinese white and sepia, in tubes, with brushes.....

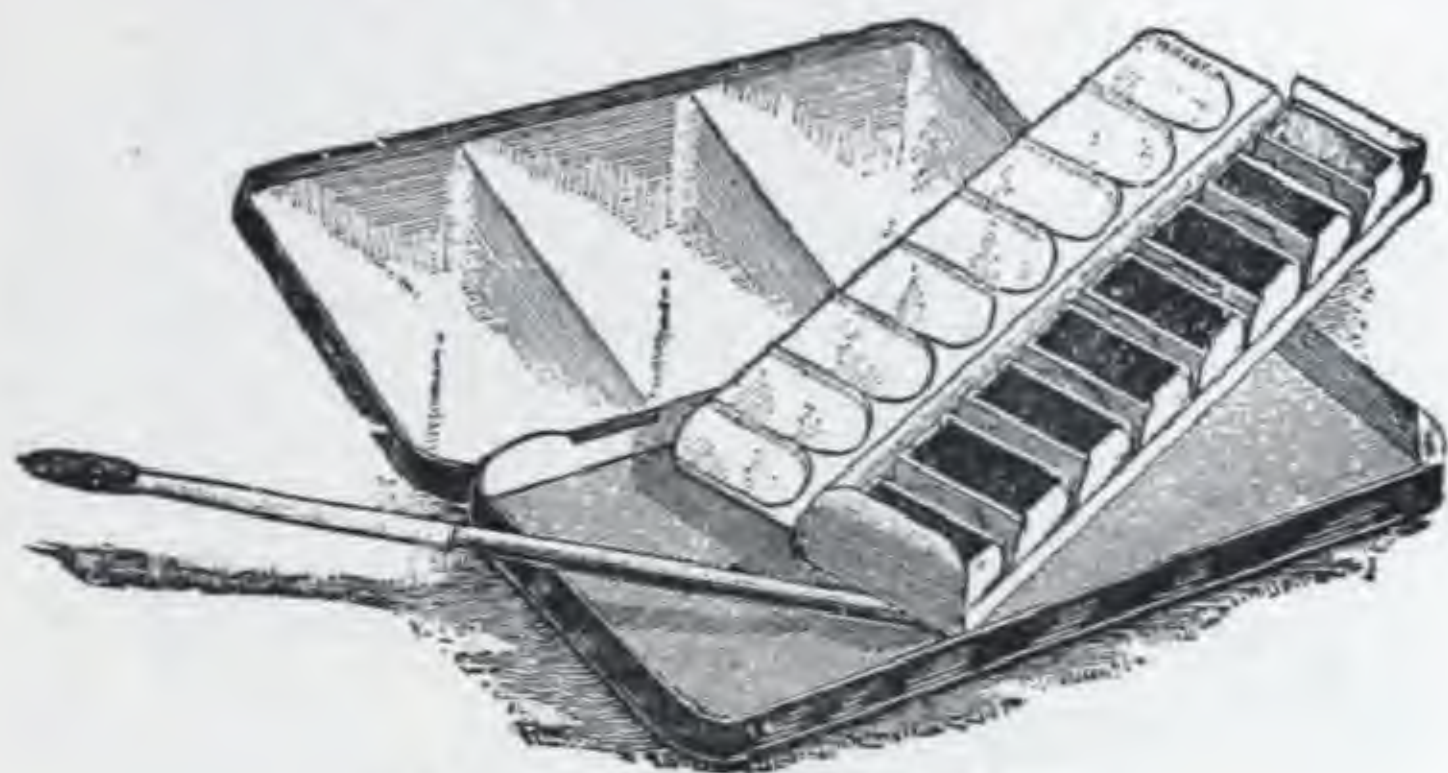
3064

See page 244 for Empty Japped Tin Boxes



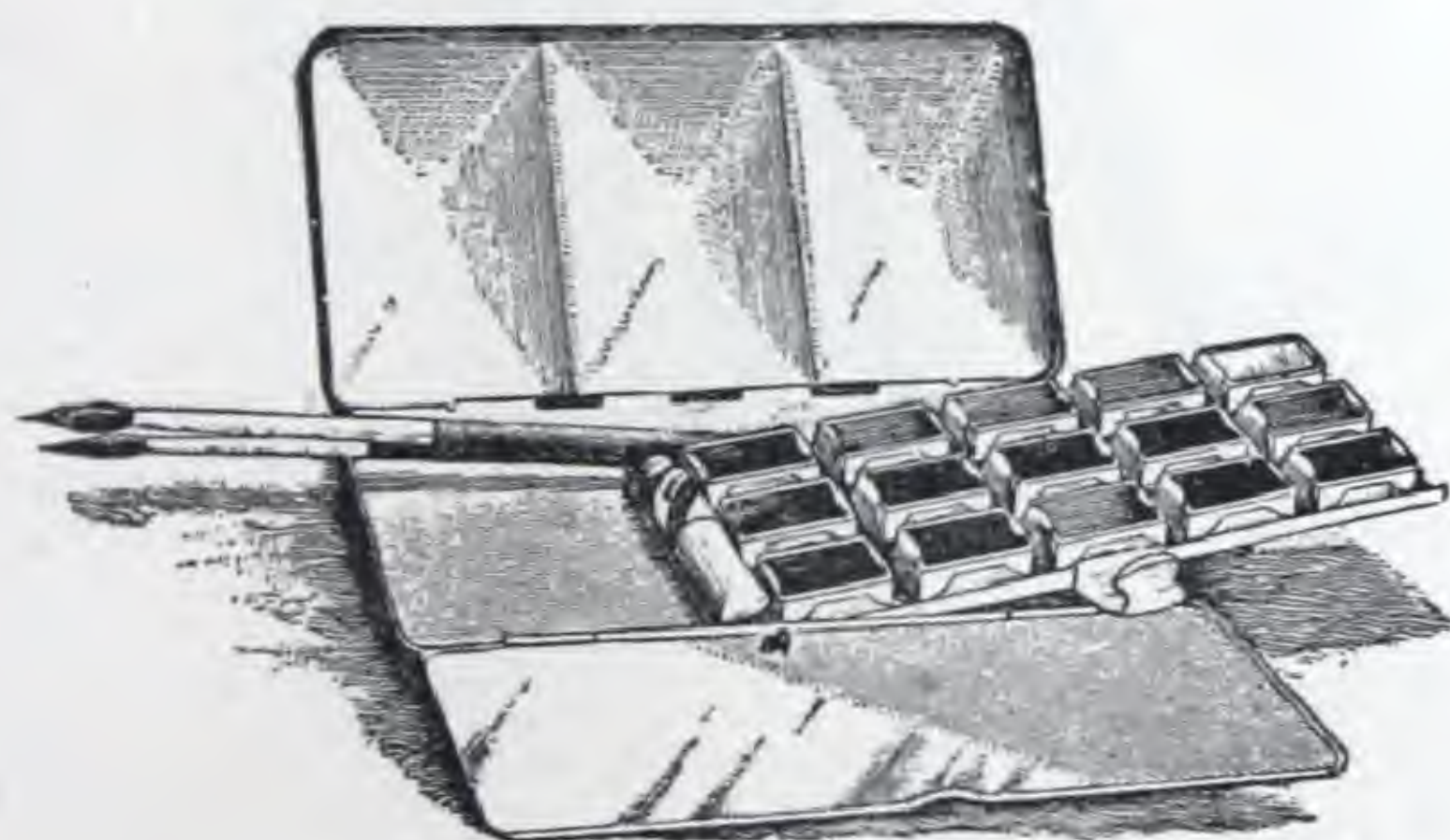
## FRENCH MOIST WATER COLORS—Continued.

In Japanned Tin Boxes

**"IMPROVED MURILLO"****3063**

EACH PER DOZ.

**3063** The "Improved Murillo" Box—Small, containing movable tray, containing 8 moist colors, in pans, with brushes.

**"IMPROVED MURILLO"****3064**

EACH PER DOZ.

**3064** The "Improved Murillo" Box—Large, containing movable tray, containing 15 moist colors, in pans, tube Chinese white, with brushes, cover arranged as palette

See page 244 for Empty Japanned Tin Boxes



## THE "STUDENTS" WATER COLOR BOX

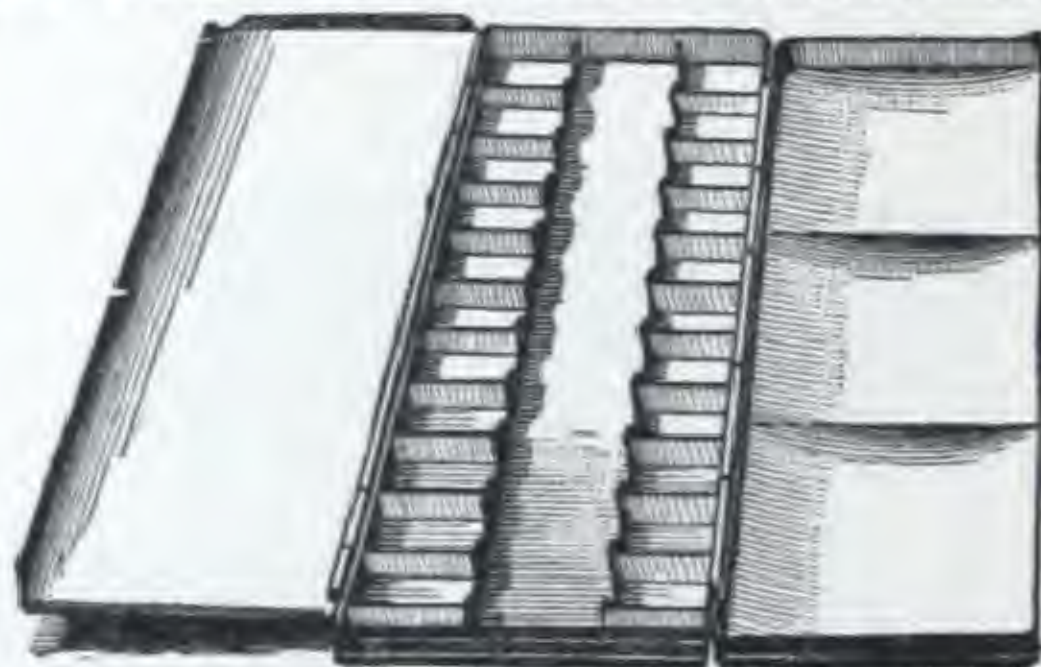


3065

EACH

- 3065 Japanned tin box, containing 12 B. K. E. Co.'s "Student's Tubes," viz.: Burnt Sienna, Orange, Gamboge, New Blue, New Green, Violet, Sepia, Alizarin Crimson, Yellow Ochre, Prussian Blue, Black, White and three brushes.....\$

## JAPANNED TIN BOXES FOR MOIST WATER COLORS—Empty



3066

## For Half Pans

EACH		EACH	
6 Divisions.....	\$	18 Divisions.....	\$
8 Divisions.....		20 Divisions.....	
10 Divisions.....		24 Divisions.....	
12 Divisions.....		30 Divisions.....	
16 Divisions.....		36 Divisions.....	

3067

## For Whole Pans

EACH		EACH	
6 Divisions.....	\$	16 Divisions.....	\$
8 Divisions.....		18 Divisions.....	
10 Divisions.....		20 Divisions.....	
12 Divisions.....		24 Divisions.....	
14 Divisions.....			

3068

## For Tubes

EACH		EACH	
12 Divisions.....	\$	24 Divisions.....	\$
15 Divisions.....		30 Divisions.....	
20 Divisions.....			

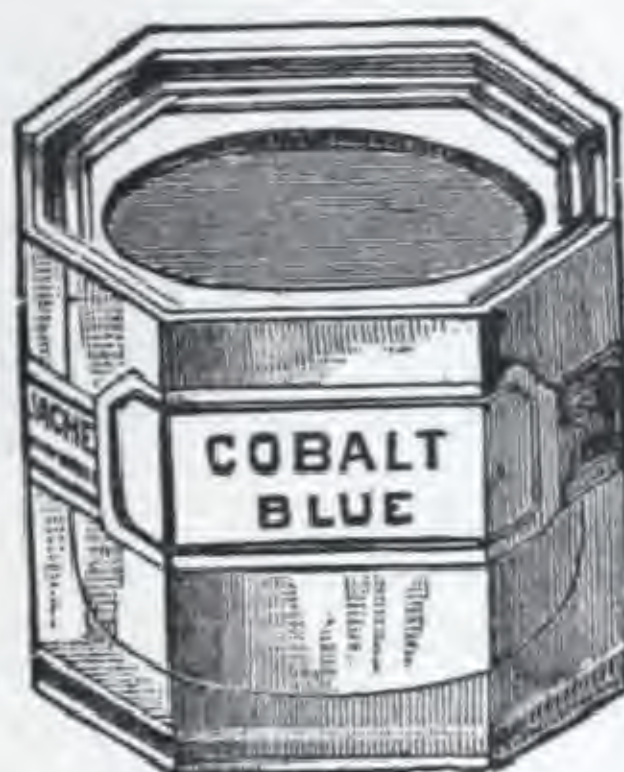


## BOURGEOIS' FRENCH MOIST WATER COLORS

## IN GLASS POTS



3069B



3069C

These pots contain more than double the quantity in the Whole Pans, at nearly the same price. They are in a moist state and readily yield to the full richness of tint upon the application of the moistened brush.

#### 3069 First Series..... EACH

Black Lake	Burnt Umber	Moss Green	Roman Ochre
Blue Black	Indian Red	Olive Green	Terre Verte
Brown Ochre	Ivory Black	Peach Black	Vandyke Brown
Brown Pink	Lamp Black	Raw Sienna	Venetian Red
Burnt Sienna	Light Red	Raw Umber	Yellow Ochre

#### 3069A Second Series..... EACH

Bright Yellow	Hookers Green	Orient Blue	Transparent Green Blue
Chinese White	Italian Pink	Orient Red	Trans. Green, Deep
Crimson Lake Light	Magenta	Payne's Grey	Trans. Green, Light
Crimson Lake Deep	Naples Yellow	Purple Light	Turkey Red
Emerald Green	Neutral Tint	Purple Deep	
Lake White	New Blue	Sap Green	

#### 3069B Third Series..... EACH

Antwerp Blue	Chrome Yellow, Med.	Lemon Yellow	Strontian Yellow
Brown Madder	Chrome Yellow, Deep	Prussian Blue	Tyrian Rose
Carmine No. 2	Cypress Green No. 1	Prussian Green	Ultramarine Blue, Light
Cerulean Blue	Cypress Green No. 2	Red Lead	Ultramarine Blue, Deep
Chinese Orange	Emeraude Green	Rose Carthame	Veronese Green
(Grenadine)	Geranium Rose	Rose Malmaison	Violet, Light
Chrome Orange	Grenadine (Chinese	Scarlet Lake	Violet, Deep
Chrome Yellow, Lemon	Orange)	Sepia	Warm Sepia
Chrome Yellow, Light	Indigo	Sevres Blue	Yellow Lake

#### 3069C Fourth Series..... EACH

Cadmium Yellow, Lemon	Cadmium Yellow, Orange	Cobalt Blue	Sky Blue
Cadmium Yellow, Light	Chrome Green, Light	Madder Lake, Deep	Gamboge
Cadmium Yellow, Med.	Chrome Green, Med.	Madder Lake, Light	
Cadmium Yellow, Deep	Chrome Green, Deep	Rose Madder	
		Scarlet Vermilion	

#### 3069D Fifth Series..... EACH

Carmine Finest	Indian Yellow	Vermilion, Light
Burnt Carmine		Vermilion, Deep

#### 3069E Sixth Series..... EACH

Carboline	Madder Carmine
-----------	----------------



## WATER COLORS

WINSOR &amp; NEWTON'S

Whole or Half Pans or Whole or Half Tubes



Whole Pan



Whole Tube

## 3070—First Series

Antwerp Blue  
Bistre  
Blue Black  
British Ink  
Bronze  
Brown Ochre  
Brown Pink  
Burnt Sienna  
Burnt Umber  
Charcoal Gray  
Chinese Blue  
Chinese White  
Chrome Lemon  
Chrome Yellow  
Chrome Deep  
Chrome Orange

Cologne Earth  
Constant White  
Cyprus Umber  
Davy's Gray  
Dragon's Blood  
Plate White  
Hooker's Green No. 1  
Hooker's Green No. 2  
Indian Red  
Ivory Black  
King's Yellow  
Lamp Black  
Light Red  
Mauve  
Naples Yellow  
Naples Yellow, Deep

Neutral Tint  
New Blue  
Payne's Gray  
Permanent Blue  
Prussian Blue  
Prussian Green  
Raw Sienna  
Raw Umber  
Roman Ochre  
Steel  
Terre Verte  
Vandyke Brown  
Venetian Red  
Yellow Lake  
Yellow Ochre

Whole Pans or  
Whole Tubes  
per doz.,  
 $\frac{1}{2}$  Pans or Tubes  
per doz.,

## 3071—Second Series

Alizarin Blue  
Alizarin Carmine  
Alizarin Crimson  
Alizarin Green  
Alizarin Orange  
Alizarin Scarlet  
Alizarin Yellow  
Black Lead  
Brown Madder  
Carmine Lake  
Crimson Lake  
Cyanine Blue

Emerald Green  
Gamboge  
Indigo  
Italian Pink  
Leitch's Blue  
Madder Carmine  
Alizarin  
Mars Yellow  
Mineral Gray  
Neutral Orange  
Olive Green  
Orange Madder Alizarin  
Permanent Brown

Permanent Crimson  
Purple Lake  
Purple Madder Alizarin  
Roman Sepia  
Rose Madder Alizarin  
Ruben's Madder  
Ruby Madder Alizarin  
Sap Green  
Scarlet Lake  
Scarlet Madder Aliz.  
Sepia  
Warm Sepia

Whole Pans or  
Whole Tubes  
per doz.,  
 $\frac{1}{2}$  Pans or Tubes  
per doz.,

## 3072—Third Series

Azure Cobalt  
Cadmium Yellow,  
Extra Pale  
Cadmium Yellow, Pale  
Cadmium Yellow  
Cadmium Yellow, Deep  
Cadmium Orange  
Cobalt Blue  
Cobalt Green  
Cobalt Violet  
Emerald Oxide of  
Chromium  
French Blue

French Ultramarine  
Indian Purple  
Indian Yellow  
Vermilion  
Veronese Green  
Viridian  
Intense Blue  
Lemon Yellow  
Mars Orange  
Mineral Violet  
Orange Vermilion  
Orient Yellow  
Oxide of Chromium

Oxide of Transparent  
Ox. of Chromium, Trans.  
Permanent Mauve  
Permanent Violet  
Permanent Yellow  
Pure Scarlet  
Pure Vermilion  
Spectrum Red  
Spectrum Violet  
Spectrum Yellow  
Ultramarine Ash Gray

Whole Pans or  
Whole Tubes  
per doz.,  
 $\frac{1}{2}$  Pans or Tubes  
per doz.,

## 3073—Fourth Series

Aureolin  
Aurora Yellow  
Burnt Carmine  
Carmine  
Cerulean Blue  
Cobalt Yellow  
Field's Orange  
Vermilion

Gallstone  
Madder Carmine  
Madder Lake  
New Oliver Green  
Pink Madder  
Primrose Aureolin  
Purple Madder  
Rose Dore

Rose Madder  
Rose Madder, Pink  
Shade  
Scarlet Madder  
Violet Carmine  
Yellow Carmine

Whole Pans or  
Whole Tubes  
per doz.,  
 $\frac{1}{2}$  Pans or Tubes  
per doz.,

## 3074—Fifth Series

Smalt

Ultramarine Ash

Whole Pans or Tubes  
 $\frac{1}{2}$  Pans or Tubes

3075  
3076  
3077  
3078  
3079  
3080

3081  
3082  
3083



## CHINESE WHITE



3076



3079



3080

EACH

- 3075 Winsor & Newton's Chinese White, in small bottle.....  
 3076 Winsor & Newton's Chinese White, in large bottle.....  
 3077 Winsor & Newton's Chinese White, in extra large bottle.....  
 3078 Devoe & Reynolds' Chinese White, in jars.....  
 3079 Bourgeois (Blanc D'Argent), in bottles.....  
 3080 Bourgeois (Blanc D'Argent), in tubes.....

## "ALBANINE" AND "PROCESS BLACK"

For Drawing in black and white for Reproductions



3081



3082



3083

EACH

- 3081 W. & N.'s Albanine, a pure photographic white.....  
 3082 W. & N.'s Process Black, a dead black of great density.....  
 3083 Semple's White, in jars.....

Special Prices in Dozen Lots



## WATERCOLOR BRUSHES

### CAMEL HAIR AND RED SABLE

As the quality of brushes can not be exactly described, and as illustrations can not be made to show quality, we mention that all the brushes we list are the very best of their respective kind. They are always the kind of hair mentioned, without adulteration or substitution, and each size contains the proper quantity of hair.

#### Illustrations Full Size



1 2 3 4 5 6 7 8

3084-3085

3084 Camel Hair, in quills.

Nos.....	1	2	3	4	5	6	7	8
Each.....								

3085 Red Sable, in quills.

Nos.....	1	2	3	4	5	6	7	8
Each.....								

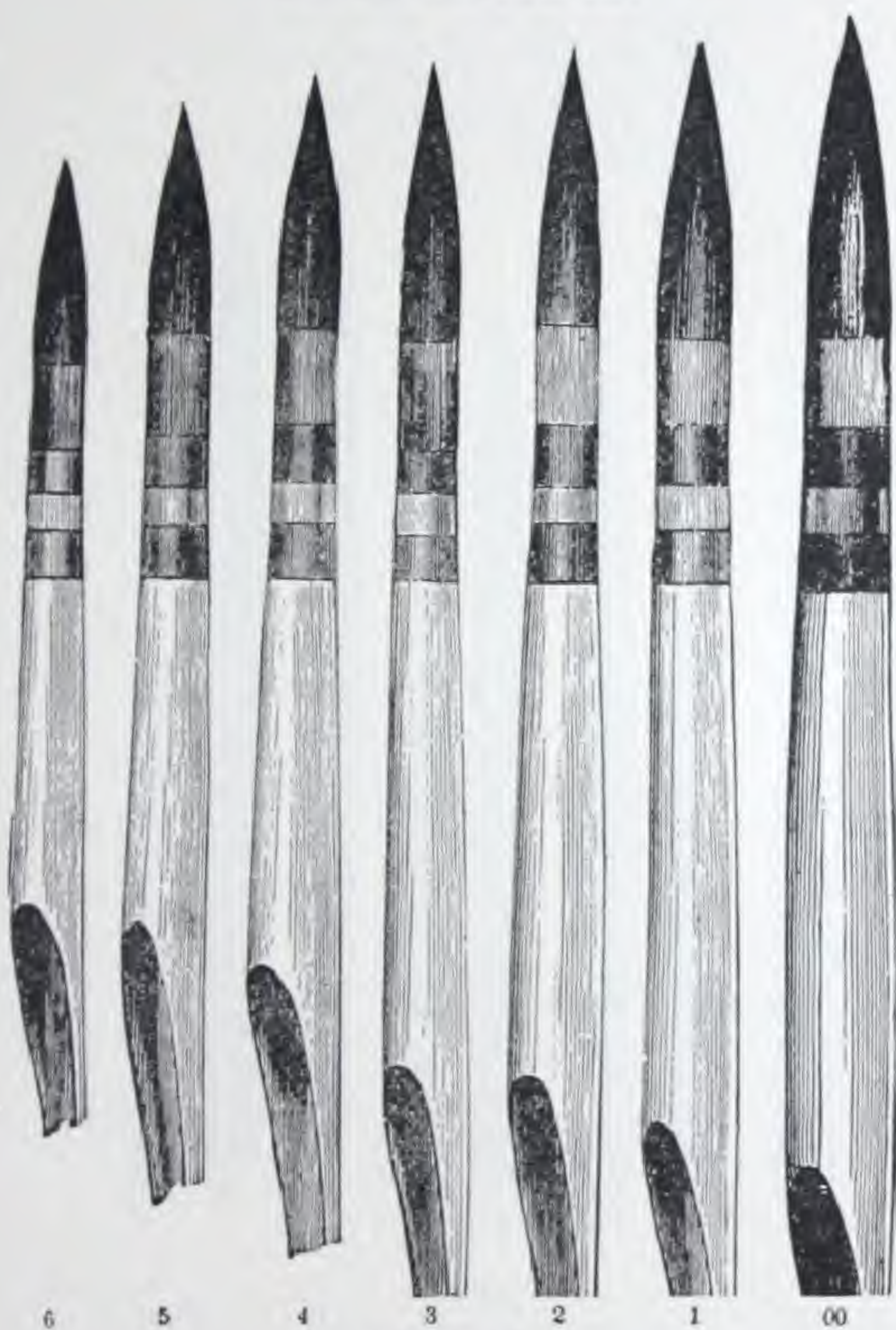


## WATER COLOR BRUSHES—Continued.

## CAMEL HAIR AND RED SABLE, IN SWAN QUILLS

For Large Water Color Washes

Illustrations Full Size



3086-3087

086 Camel Hair, in swan quill.

Nos.....	00	0	1	2	3	4	5	6
Each.....								

087 Red Sable, in swan quill.

Nos.....	1	2	3	4	5	6
Each.....						



**CAMEL HAIR BRUSHES  
FOR WATER COLOR PAINTING**

Illustration Full Size



3088

**3088** Camel Hair, in nickel-plated ferrules, polished handles.

Nos.....	1	2	3	4	5	6	7
Each.....							



RED SABLE BRUSHES  
FOR WATER COLOR PAINTING  
Illustrations Full Size  
EXTRA FINE QUALITY (Imported)



3089

3089 Red Sable, round, in albata, with handle.  
Nos. . . . 0 1 2 3 4 5 6 7 8 9 10  
Each . . .

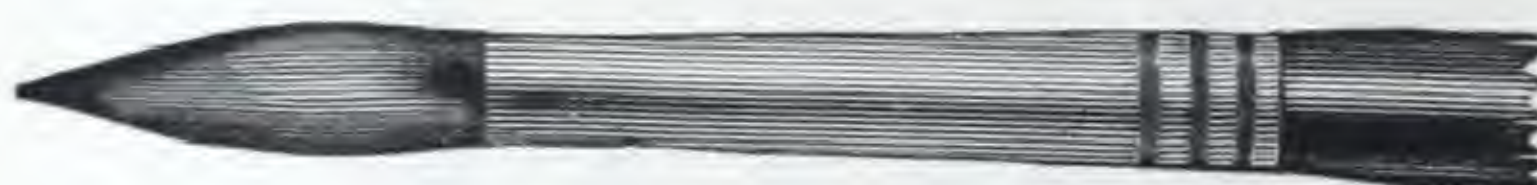


## DOUBLE-POINTED BRUSHES

## FOR WATER COLOR WASHES

Illustrations Full Size

Size No. 3



3090

3090 Camel Hair, round, double end, in tin.

Nos. . . . . 0 1 2 3

Each. . . . .

3091 Camel Hair, flat, double end, in tin.

Nos. . . . . 0 1 2 3

Each. . . . .



Size No. 3



3092

3092 Red Sable, round, double end, in albata.

Nos. . . . . 00 0 1 2 3 4

Each. . . . .

3093 Red Sable, flat, double end, in albata.

Nos. . . . . 00 0 1 2 3 4

Each. . . . .



# WATERCOLOR BRUSHES

## FOR WATER COLOR WASHES

Illustrations Full Size



Size No. 3

3094

3094 Camel Hair, round, single end, in tin ferrules.

Nos.	0	1	2	3	4
------	---	---	---	---	---

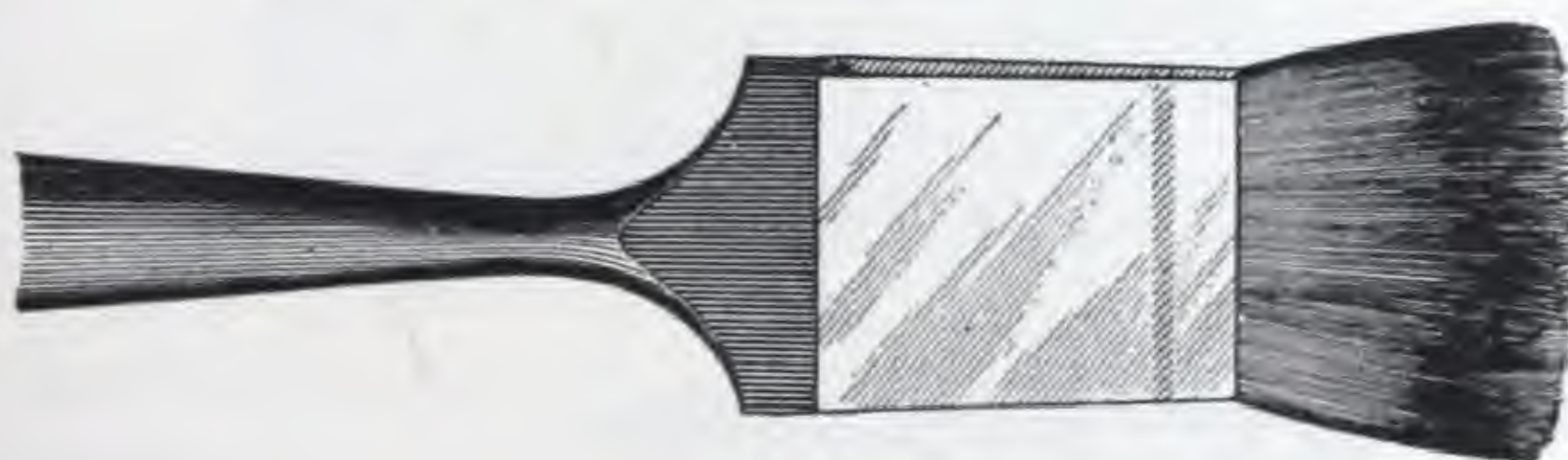
Each					
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3094½ Camel Hair, flat, single end, in tin ferrules.

Nos.	0	1	2	3	4
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Each					
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## CAMEL HAIR WASH BRUSH, Broad, Flat



3095

3095 Red Polished Handles, tin ferrules.

Size, inches	½	¾	1	1¼	1½	1¾	2
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Each							
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## CHINAWARE



3096



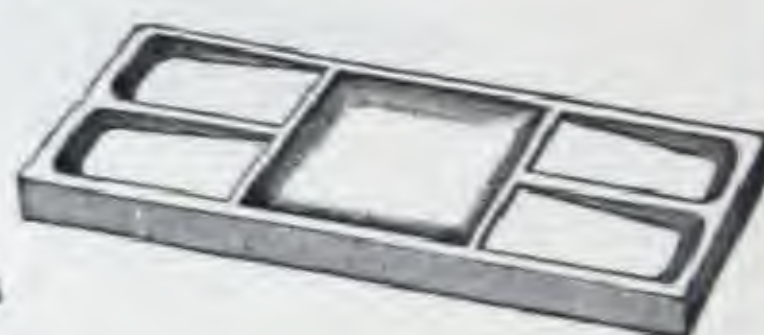
3096D

EACH

- 3096 Ink or Color Slab, 3 wells, 1 slope,  $1\frac{1}{2} \times 2\frac{3}{4}$  inches.....  
 3096A Ink or Color Slab, 3 wells, 1 slope,  $2\frac{3}{8} \times 3\frac{5}{8}$  inches.....  
 3096B Ink or Color Slab, 3 wells, 1 slope,  $2\frac{1}{4} \times 4$  inches.....  
 3096C Ink or Color Slab, 3 wells, 1 slope,  $2\frac{3}{4} \times 4\frac{1}{2}$  inches.....  
 3096D Ink or Color Slab, 3 wells, 3 slopes,  $2\frac{1}{4} \times 4$  inches.....  
 3096E Ink or Color Slab, 5 wells, 5 slopes,  $4\frac{1}{4} \times 7\frac{3}{4}$  inches.....



3096 1/2



3096 1/2 A

EACH

- 3096 1/2 China Brush Rest,  $5\frac{1}{2}$  inches long.....  
 3096 1/2 A Center Slab, 5 divisions,  $2\frac{3}{8} \times 6\frac{1}{4}$  inches.....



3097B

EACH

- 3097 Sloping Tile, 3 divisions,  $2\frac{1}{4} \times 4\frac{1}{8}$  inches.....  
 3097A Sloping Tile, 4 divisions,  $3 \times 7\frac{7}{8}$  inches.....  
 3097B Sloping Tile, 5 divisions,  $3\frac{1}{8} \times 7\frac{7}{8}$  inches.....  
 3097C Sloping Tile, 6 divisions,  $3\frac{1}{8} \times 8$  inches.....  
 3097D Sloping Tile, 8 divisions,  $6 \times 7\frac{7}{8}$  inches.....  
 3097E Sloping Tile, 12 divisions,  $6\frac{5}{8} \times 7\frac{7}{8}$  inches.....



3097 1/2



3097 1/2 A

- 3097 1/2 Artists' Water Glasses.  
 Diameter, inches.....  $2\frac{3}{8}$   $2\frac{3}{4}$   $3\frac{1}{4}$   $3\frac{1}{2}$  4  
 Each.....  
 3097 1/2 A China Tinting Saucers.  
 Diameter, inches.....  $2\frac{1}{2}$  3  $3\frac{1}{2}$  4  
 Each.....



## CHINAWARE—Continued.



3098



3098½

EACH

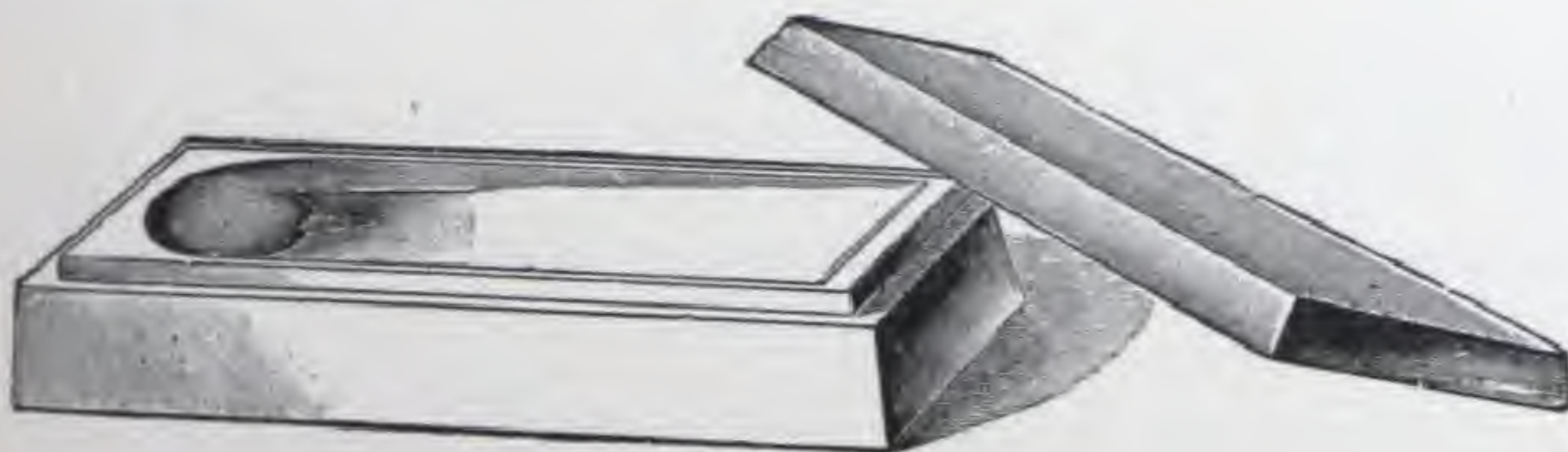
- 098 Nest of Cabinet Saucers, 6 in set, 2⅜ inches.....  
 098A Nest of Cabinet Saucers, 6 in set, 2⅝ inches.....  
 098B Nest of Cabinet Saucers, 6 in set, 3¼ inches.....  
 098C Nest of Cabinet Saucers, 6 in set, 3⅞ inches.....  
 098½ Architects' Slant and Basin, 8 divisions and cup, 7 inches diameter..



3099

EACH

- 099 Slate Ink Slab, with glass cover, 3½ x 3½ inches.....



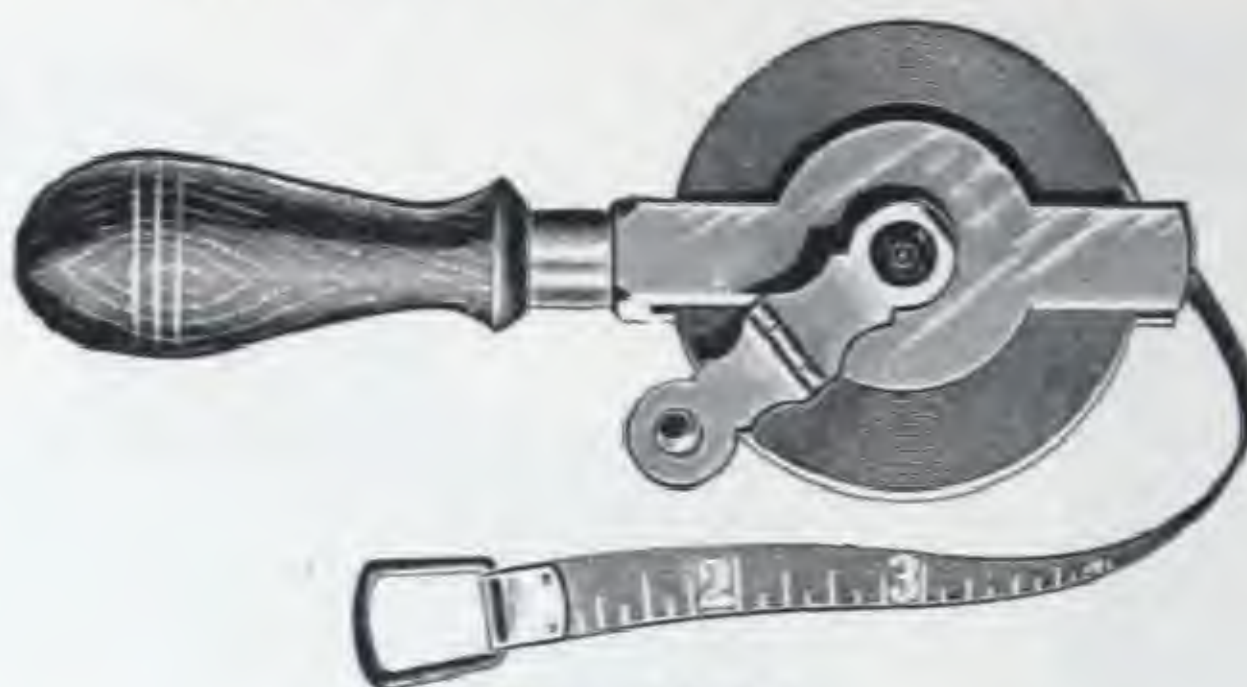
3099½

EACH

- 099½ Improved Ink Slab, with cover, size 2⅛ x 5¼ inches.....



## STEEL MEASURING TAPES



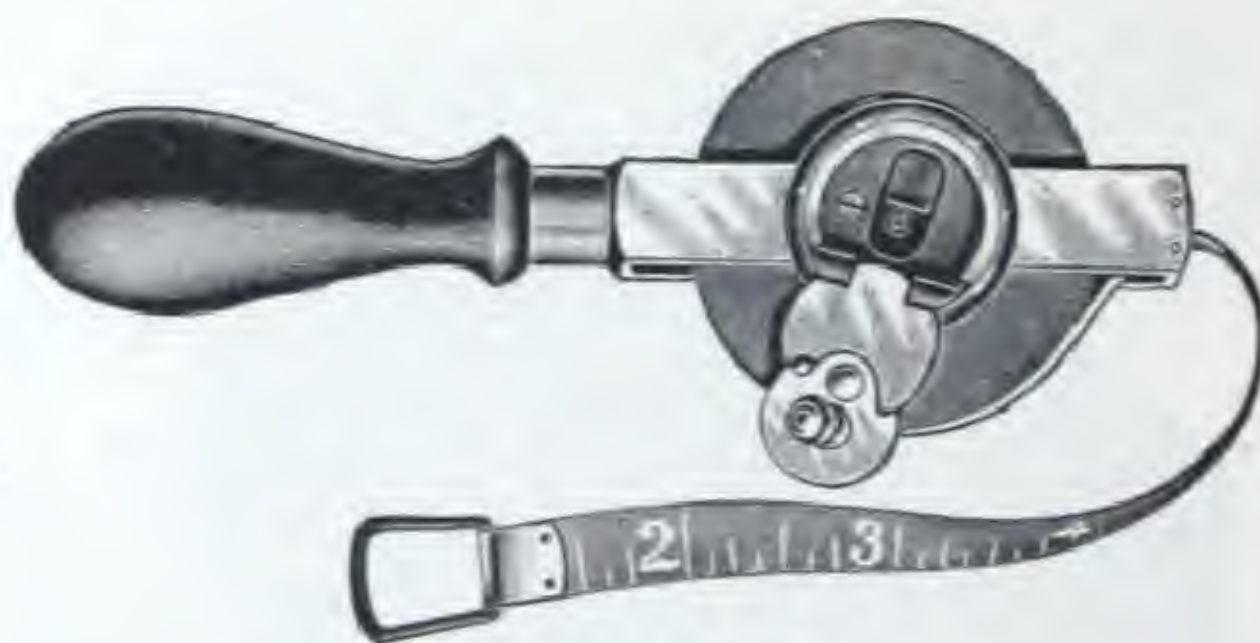
4000T-4001T

"Standard" Steel Tapes, steel ribbon,  $\frac{3}{8}$  inches wide, folding winding handle frames and trimmings of brass, nicely nickel-plated, with rosewood handles. Graduations begin at end of ring.

	Length in feet	50	100	200
4000D	Divided in 10ths, each.....	\$		
4000T	Divided in 12ths, each.....			

"Standard" Steel Tapes,  $\frac{1}{2}$ -inch steel ribbon, otherwise same as above.

	Length in feet	50	100	200
4001D	Divided in 10ths, each.....	\$		
4001T	Divided in 12ths, each.....			

4002T-4002 $\frac{1}{2}$ T

"Reliable" Steel Tapes, steel ribbon  $\frac{3}{8}$  or  $\frac{1}{2}$  inch wide, nickel-plated brass frames and trimmings, and patent double folding flush handle, opened by pressing small pin or button on opposite side.

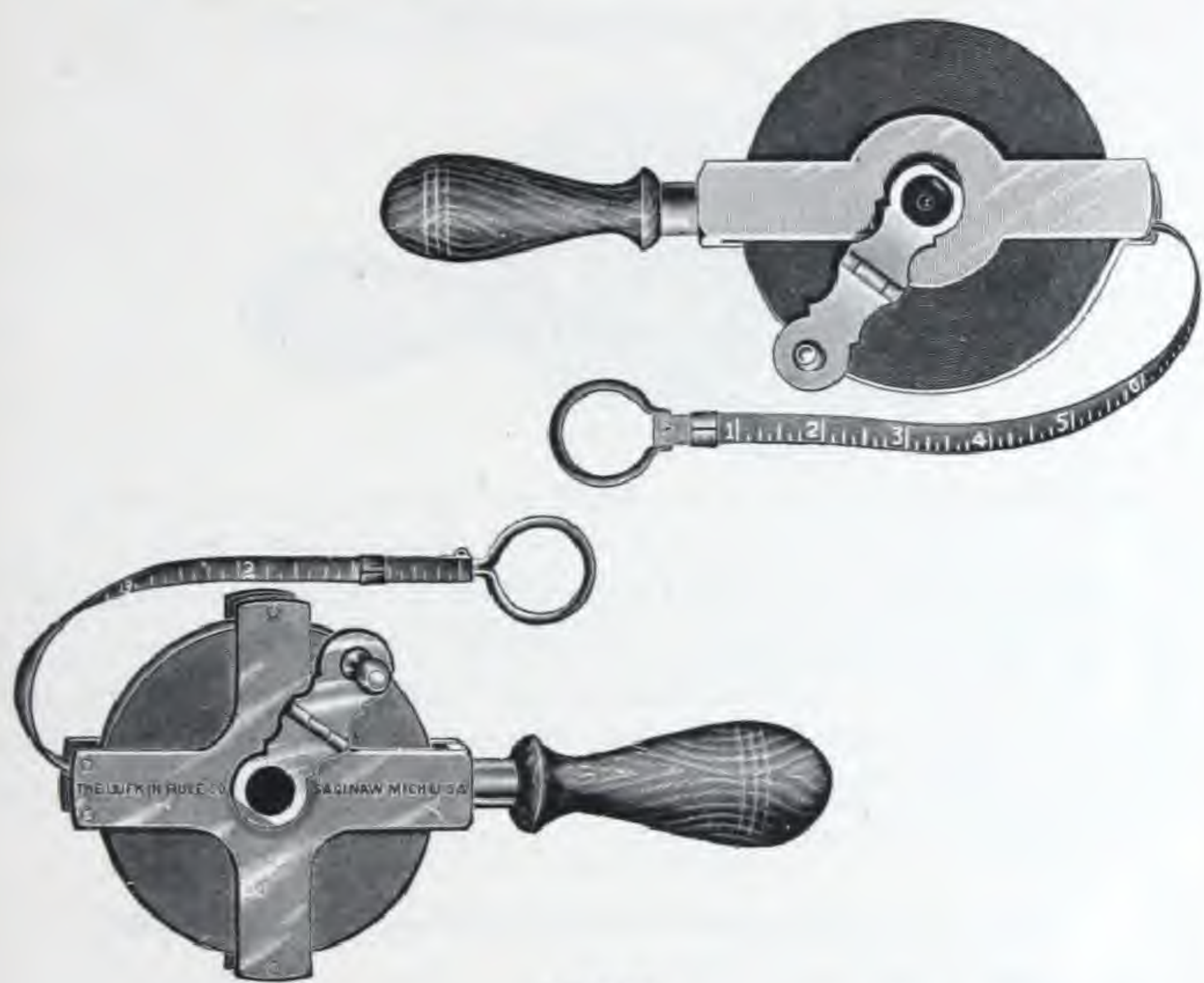
	Length in feet	50	100	200
4002D	Divided in 10ths, $\frac{3}{8}$ -inch ribbon, each.....	\$		
4002T	Divided in 12ths, $\frac{3}{8}$ -inch ribbon, each.....			
4002 $\frac{1}{2}$ D	Divided in 10ths, $\frac{1}{2}$ -inch ribbon, each.....			
4002 $\frac{1}{2}$ T	Divided in 12ths, $\frac{1}{2}$ -inch ribbon, each.....			

Tapes over 100 feet long are supplied with 4-arm frame, as shown on page 257



STEEL MEASURING TAPES—Continued.

ENGINEER'S PATTERN FRAME STEEL TAPES



4003T

"Engineer's" Pattern Frame Steel Tapes, with 1/4-inch wide steel ribbon, with two detachable rings, folding winding handle, frames and trimmings of brass, nicely nickel plated. When tapes are detached for use, the frames can be conveniently carried in pocket. The tape can be readily detached from frame and we furnish an extra ring for the other end. Marked on one side in tenths or twelfths.

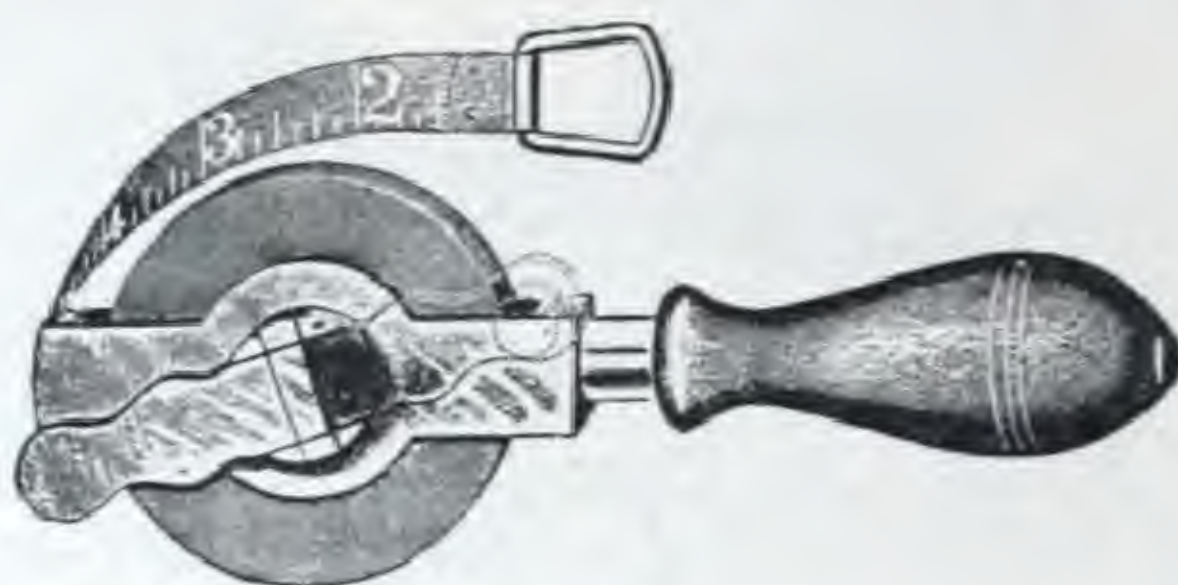
	Feet.....	50	100	200
4003D	Divided 10ths, each.....	\$		
4003T	Divided 12ths, each.....			

Tapes 100 feet and longer supplied with 4-arm frame, as shown above



## STEEL MEASURING TAPES—Continued.

## LOCK HANDLE FRAME STEEL TAPES



4006T

These frames are the same as our "Engineer's" Pattern and "Standard," except in the winding apparatus. This consists of the regular frame, but is fitted with a folding lock handle, which folds over the tape, enabling one to stop it at any desired length. This handle, on account of its length, also affords increased winding leverage, which, together with the large knob, makes it especially convenient and easy winding.

"Engineer's" Pattern,  $\frac{1}{4}$ -inch wide steel ribbon, detachable rings.

	Length in feet.....	50	100
4004D	Divided 10ths, each.....	\$	
4004T	Divided 12ths, each.....		

"Standard" Steel Tapes, with  $\frac{3}{8}$ -inch wide steel ribbon, otherwise same as above.

	Length in feet.....	50	100
4005D	Divided 10ths, each.....	\$	
4005T	Divided 12ths, each.....		

"Standard" Steel Tapes,  $\frac{1}{2}$ -inch steel ribbon, otherwise same as above.

	Length in feet.....	50	100
4006D	Divided 10ths, each.....	\$	
4006T	Divided 12ths, each.....		



## MEASURING TAPES—Continued

## "BANNER" STEEL MEASURING TAPES



4007T

Cases made of steel, covered with handsome mottled black "Auto Leather," which is extraordinarily durable. The black case with nickel plated trimmings gives a very attractive appearance, and is fitted with a folding flush handle, opened by pressing button on opposite side. The "Banner" is designed to meet the demand for a serviceable steel tape at a moderate price. The measurements are guaranteed accurate.  $\frac{3}{8}$  inch wide.

	Length in feet.....	25	50	100
4007T	Divided 12ths, each.....			

## DETACHABLE RINGS

For Engineers' Pattern Steel Tapes



4008



4009

PER PAIR

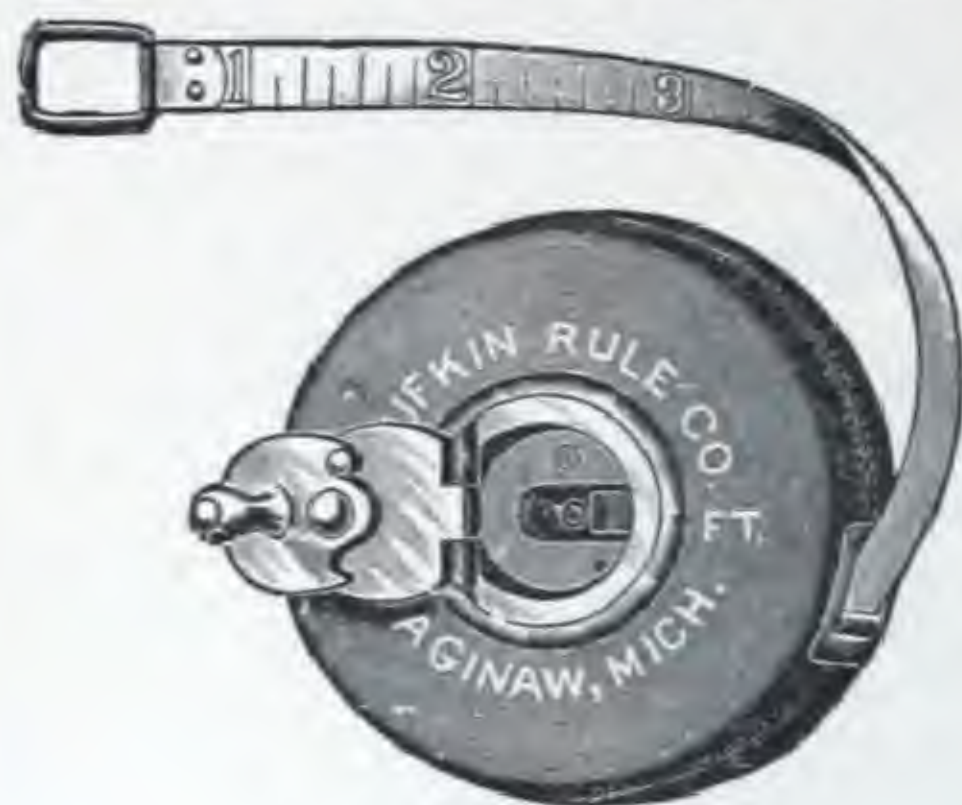
- 4008 Plain Detachable Handles for  $\frac{1}{4}$ -inch tapes, small, 1 inch round....  
 4009 Plain Detachable Handles for  $\frac{1}{4}$ -inch tapes, large, 3 inch oval....

## REPAIRING STEEL TAPES

We promptly attend to any repairs on steel tapes and execute them in the most approved manner at moderate charge.



## STEEL MEASURING TAPES—Continued.



4010T



4012T

"Reliable" Steel Measuring Tapes,  $\frac{3}{8}$ -inch wide steel ribbon, hard leather cases, double folding flush handle.

	Length in feet	25	50	75	100
	Diameter of case, inches	$2\frac{3}{4}$	$3\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{2}$
4010D	Divided in 10ths and links, each . . . . .				
4010T	Divided in 12ths and links, each . . . . .				

"Reliable" Steel Measuring Tapes,  $\frac{1}{2}$ -inch wide steel ribbon, otherwise same as No. 4010T.

	Length in feet	25	50	100
	Diameter of case, inches	$2\frac{3}{4}$	$3\frac{1}{4}$	$4\frac{1}{2}$
4011D	Divided in 10ths and links, each . . . . .			
4011T	Divided in 12ths and links, each . . . . .			

"Reliable Junior" Steel Measuring Tapes,  $\frac{1}{4}$ -inch wide steel ribbon, hard leather cases, double folding flush handle.

	Length in feet	25	50	100
	Diameter of case, inches	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{3}{4}$
4012D	Divided in 10ths, each . . . . .			
4012T	Divided in 12ths, each . . . . .			

## *Instantaneous* READINGS

Among the notable improvements that the Lufkin Rule Co. have brought out since the last number of our catalogue was issued is the

## *Instantaneous*

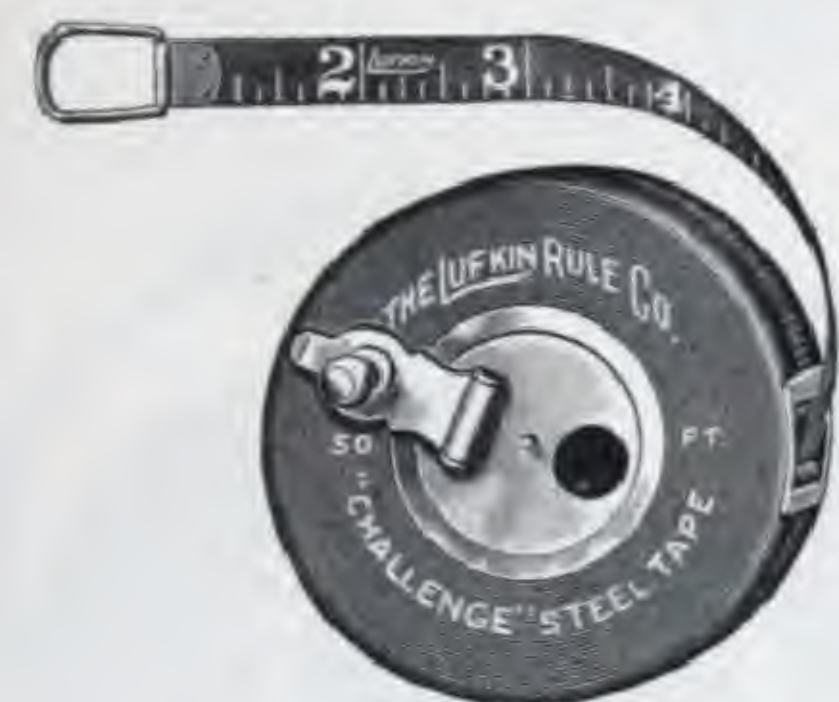
Readings. It is a method of marking measuring tapes that makes errors impossible, and in addition is a great saver of time.



The illustration above will give an idea of this marked improvement. Briefly described, it consists of repeating the foot mark, in easily distinguishable figures, at each inch or tenth foot, as the case may be. Does away with all referring back to the last foot and its consequent difficulties and delays. The total reading is always directly before the eye. These graduations are furnished on all of Lufkin's Steel and Metallic Tapes.



## STEEL MEASURING TAPES—Continued.



4014T



4016T

"Challenge" Steel Measuring Tapes,  $\frac{3}{8}$  inch wide steel ribbon, hard leather cases, flush handle.

Length in feet.....	25	50	100
Diameter of case, inches.....	$2\frac{3}{4}$	$3\frac{1}{4}$	$4\frac{1}{2}$
4014D Divided 10ths, each.....			
4014T Divided 12ths, each.....			

"Challenge Junior" Steel Measuring Tapes,  $\frac{1}{4}$  inch wide steel ribbon, hard leather cases, flush handle, otherwise same as No. 4014T.

Length in feet	25	50	100
Diameter of case, inches	$2\frac{1}{4}$	$2\frac{7}{8}$	$3\frac{3}{4}$
4015D Divided 10ths, each.....			
4015T Divided 12ths, each.....			

"Rival" Steel Measuring Tapes,  $\frac{3}{8}$  inch wide steel ribbon, nickel-plated steel cases, flush handle.

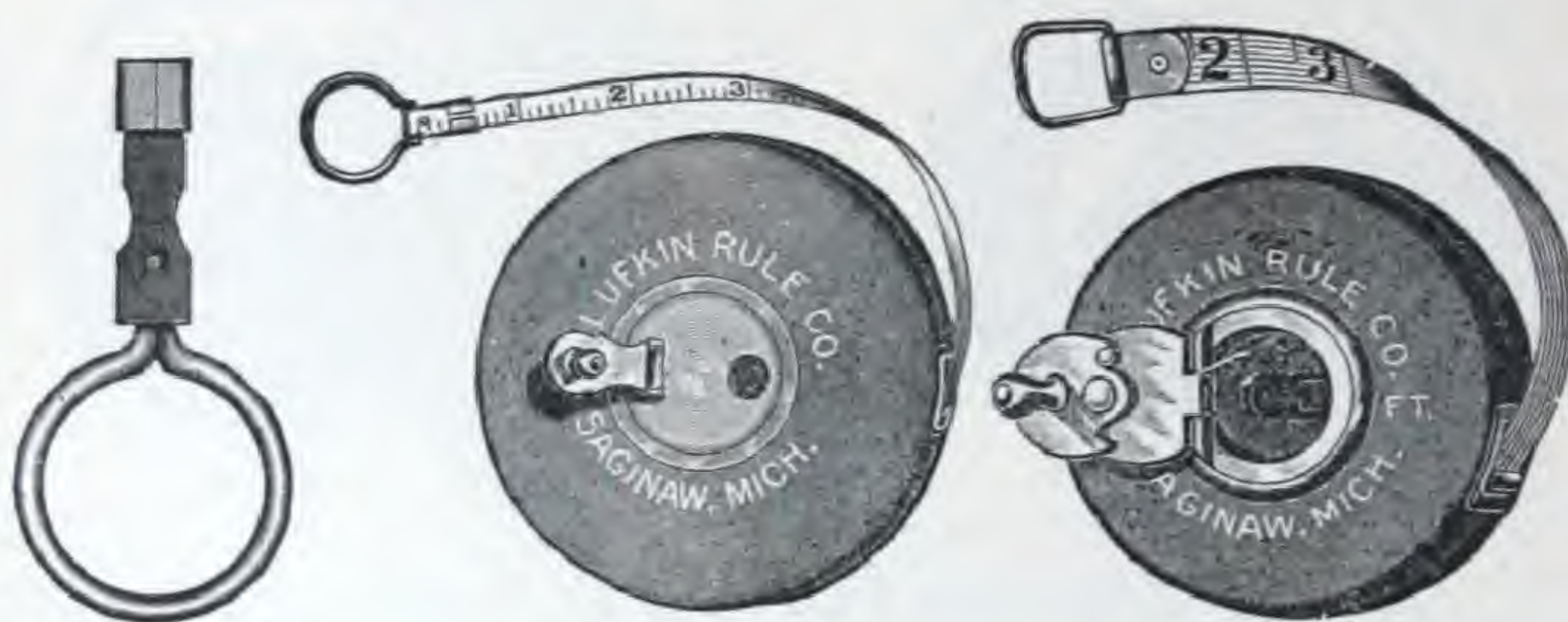
Length in feet	25	50	100
Diameter of case, inches	$2\frac{3}{4}$	$3\frac{1}{4}$	$4\frac{1}{4}$
4016D Divided 10ths, each.....			
4016T Divided 12ths, each.....			

"Rival Junior" Steel Measuring Tapes,  $\frac{1}{4}$  inch wide steel ribbon, nickel-plated steel cases, flush handle, otherwise same as No. 4016T.

Length in feet	25	50	100
Diameter of case, inches	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{5}{8}$
4017D Divided 10ths, each.....			
4017T Divided 12ths, each.....			



## MEASURING TAPES—Continued.



4018D

4019T

"Engineers'" Pattern Steel Tapes,  $\frac{1}{4}$  inch wide steel ribbon, hard leather steel lined cases, two detachable rings. The tape can be readily detached from the case, and we furnish an extra ring for the other end. The steel is heavier and stronger than used in the regular steel tapes, and the cases are thinner.

Length in feet	50	100
Diameter of case, inches	$4\frac{1}{4}$	$5\frac{1}{4}$

4018D Divided 10ths and links, each.....

4018T Divided 12ths and links, each.....

"Lufkin Improved" Metallic Measuring Tapes,  $\frac{5}{8}$  inch wide best woven linen, with metallic warp, hard leather cases, with patent double folding flush handle.

Length in feet	25	50	100
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4019D Divided 10ths and links, each.....

4019T Divided 12ths and links, each.....

"Lufkin's Metallic" Measuring Tapes, without cases.

Length in feet	25	50	100
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4020D Divided 10ths and links, each.....

4020T Divided 12ths and links, each.....



## METALLIC MEASURING TAPES—Continued.



4021T

"Lufkin's Metallic" Measuring Tapes,  $\frac{5}{8}$  inch wide, best woven linen, with metallic warp, hard leather cases, brass folding handles and brass trimmings.

Length in feet	25	50	100
----------------	----	----	-----

4021D Divided 10ths and links, each.....

4021T Divided 12ths and links, each.....

## "JUNIOR" METALLIC MEASURING TAPES

Flush Handle



4022T

"Junior" Metallic Measuring Tapes,  $\frac{3}{8}$  inch wide best woven linen, with metallic warp, hard leather cases, nickel-plated trimmings.

The "Junior" Metallic is a companion to our popular "Reliable Junior," and is less than one-half the size and weight of a regular metallic tape.

Length in feet	25	50
Diameter of cases, inches	$2\frac{3}{4}$	$3\frac{1}{2}$

4022D Divided 10ths only, each.....

4022T Divided 12ths only, each.....

For Metallic Tapes only, without cases, see pages 262 and 264



## CHESTERMAN'S MEASURING TAPES



4023T

Chesterman's Steel Measuring Tapes,  $\frac{3}{8}$  inch wide steel ribbon, flush handle, red leather case, graduations beginning at end of ring.

	Length in feet	25	50	100
4023D	Divided 10ths and links, each.....			
4023T	Divided 12ths and links, each.....			

Chesterman's Metallic Measuring Tapes,  $\frac{5}{8}$  inch wide, wire woven or metallic, red leather case, folding handle, graduations beginning at end of ring.

	Length in feet	25	50	100
4024D	Divided 10ths and links, each.....			
4024T	Divided 12ths and links, each.....			

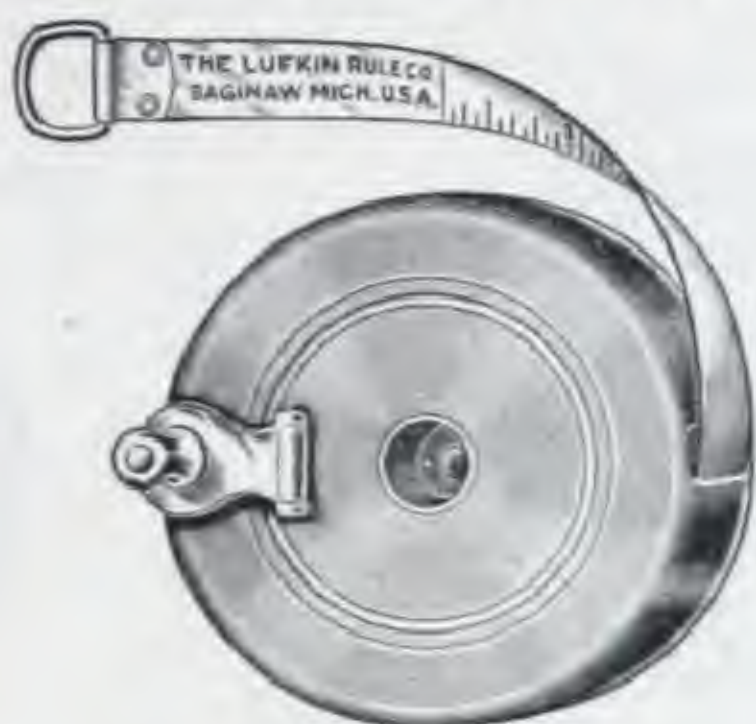
Chesterman's Metallic Measuring Tapes, without case.

	Length in feet	25	50	100
4025D	Divided 10ths and links, each.....			
4025T	Divided 12ths and links, each.....			

We promptly attend to any repairs on steel tapes and execute them in the most approved manner at a moderate charge.



## STEEL POCKET TAPES



4026-4027

The "Artisan" Tape, with  $\frac{3}{8}$ -inch wide steel ribbon, nickel-plated cases.

Length in feet.....	8	12	15	20
Diameter of case, inches.....	2	2	$2\frac{3}{8}$	$2\frac{3}{8}$
026 Divided in feet, inches and 16ths, one side only				
Each.....				

## "ARTISAN" TAPES WITH DIAMETER MEASUREMENTS

These tapes are marked on one side in consecutive inches, other side with diameter graduations, enabling one, by measuring the circumference, to arrive at the exact diameter, as fine as 64ths of inch, of circular objects, such as pulleys, shafting, piping, columns, etc., otherwise same as No. 4026.

Length in feet.....	8	12	15	20
027 Divided consecutive inches (other side diameter graduations), each.....				



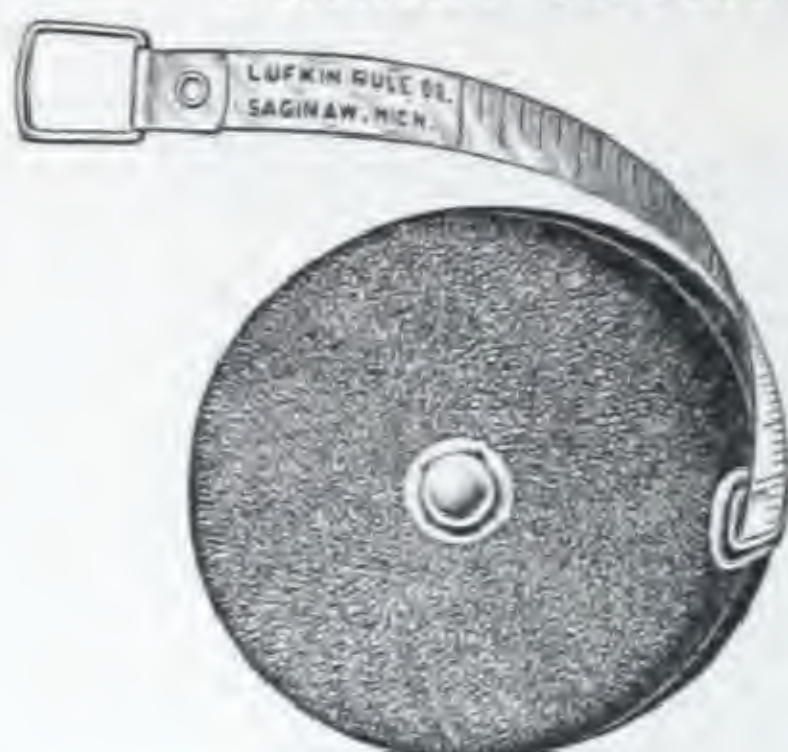
4028-4029

"Lufkin" Pocket Steel Tapes, with  $\frac{1}{4}$ -inch wide steel ribbon, German silver cases, spring wind, with center stop, marked one side only.

Length in feet.....	3	5	6	8
028 Divided inches and 16ths, each.....				
029 Divided feet, inches and 16ths, each.....				



## POCKET TAPES IN LEATHER CASES



4030-4033



4034

Pocket Tapes in leather cases, with  $\frac{1}{4}$ -inch wide steel ribbon, cases of assorted colored leather, metal lined, spring wind, center stop, trimmings silver plated. A beautiful and durable article. EACH

4030 Divided inches and 16ths, 36 inches long.....

4031 Divided inches and 16ths, 60 inches long.....

4032 Divided inches and 16ths (other side feet, 10ths and 100ths,) 36 inches long.....

4033 Divided inches and 16ths (other side feet, 10ths and 100ths), 60 inches long.....

"Midget" Steel Pocket Tapes, leather metal lined cases, with  $\frac{5}{32}$ -inch wide steel ribbon; diameter of case 1 inch, the smallest tape made, otherwise same as No. 4030. EACH

4034 Divided inches and 16ths, 36 inches long.....



4035-4037



4038

Pocket Steel Tapes,  $\frac{1}{4}$ -inch wide steel ribbon, round edge, nickel plated brass cases, spring wind, center stop. EACH

Length in inches..... 36 60 72 96

4035 Divided inches and 16ths.....

4036 Divided feet, inches and 16ths.....

4037 Divided inches and 16ths (other side feet, 10ths and 100ths).....

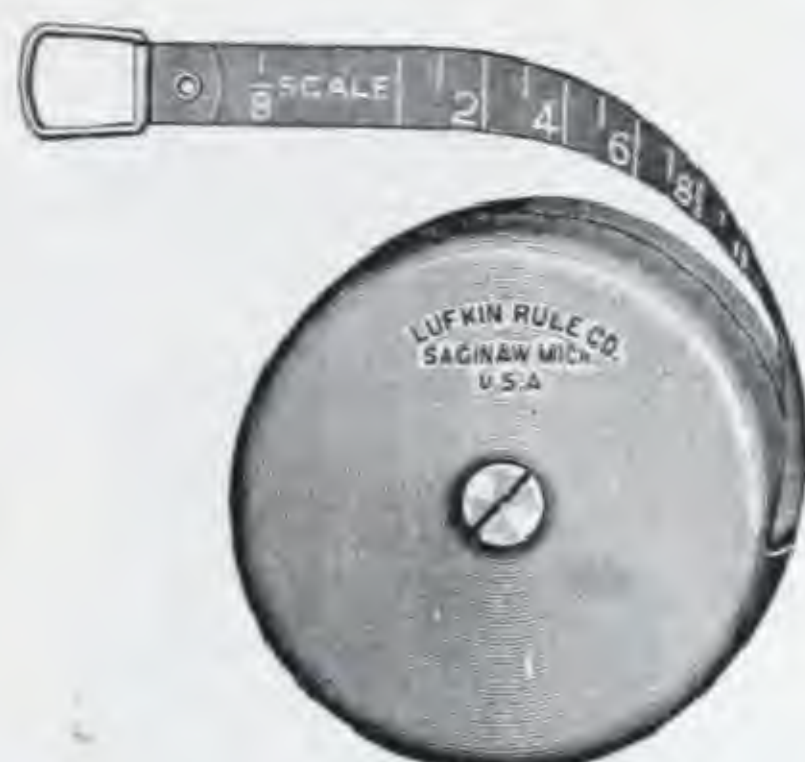
"Petit" Steel Pocket Tapes, with  $\frac{5}{32}$ -inch wide steel ribbon, spring wind, center stop, German silver cases,  $1\frac{1}{8}$  inches in diameter. EACH

4038 Divided inches and 16ths (one side only), 36 inches long.....

For description of Longer Pocket Steel Tapes, see pages 265-267



## POCKET STEEL TAPES WITH ARCHITECTS' SCALES



4039-4040

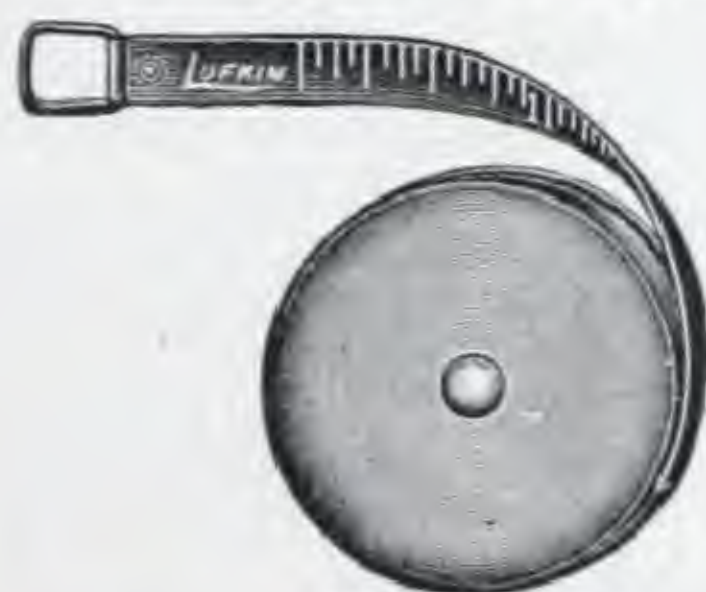
Pocket Steel Tapes, with Architects' Scales, with  $\frac{1}{4}$ -inch steel ribbon, round edge, nickel-plated brass cases, spring wind, with center stop.

EACH

**4039** Divided inches and 16ths, other side Architects' Scale, with  $\frac{1}{8}$ -inch scale, marked and numbered from one to 480, 60 inches long.....

**4040** Divided inches and 10ths, other side Architects' Scale, with  $\frac{1}{4}$ -inch scale, marked and numbered from 1 to 240, 60 inches long.....

## "MARVEL" POCKET STEEL TAPES



4041

Marked Inches and Sixteenths One Side, Millimeters Other Side

EACH

**4041** 36 inches, 1 meter.....

**4041A** 60 inches,  $1\frac{1}{2}$  meter.....

**4041B** 72 inches, 2 meter.....

## EXTRA LONG POCKET STEEL TAPES

German Silver Cases, Spring Wind, Center Stop, with  $\frac{1}{4}$ -inch wide Steel Ribbon, marked one side only

**4042T** Length in feet..... **25**  
Divided feet and 12ths (inches and 16ths).....EACH

**4042D** Divided feet, 10ths and 100ths of feet.....EACH



## STEEL MEASURING TAPES

## THE "WOLVERINE"



4043D

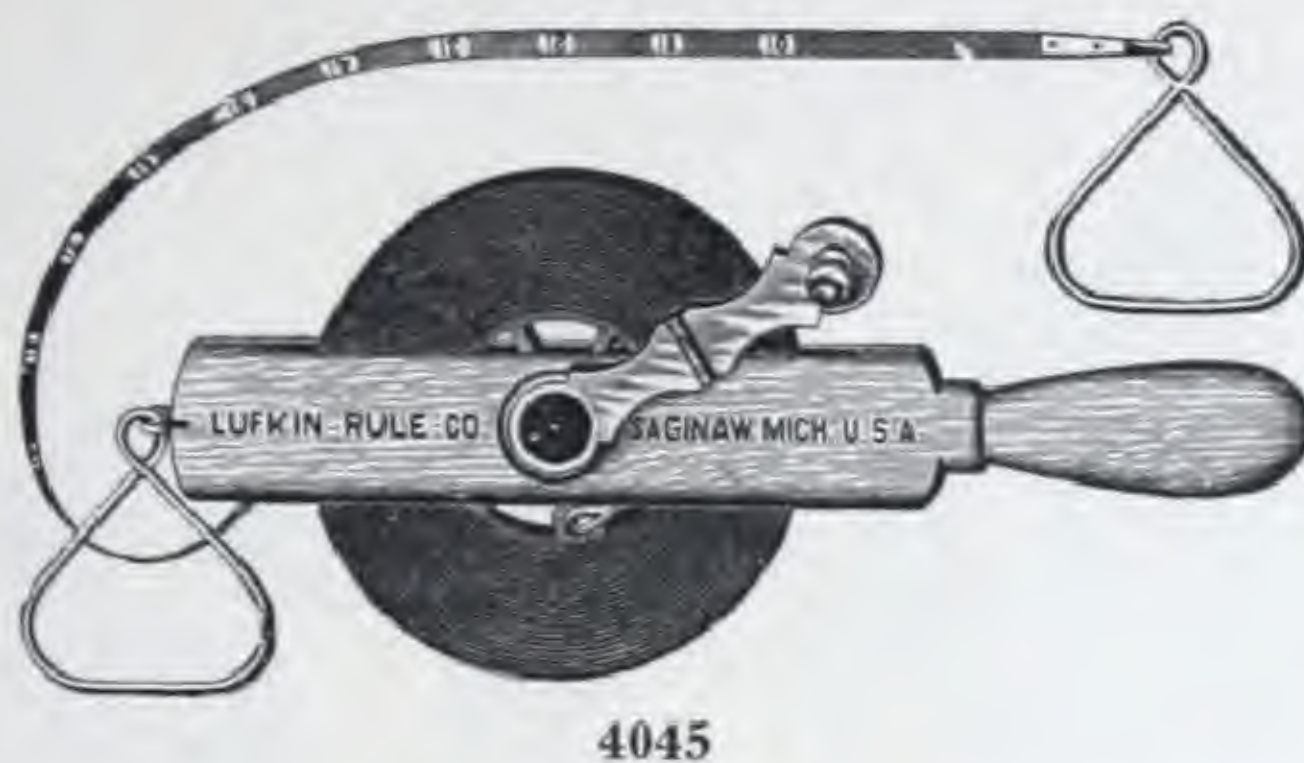
The "Wolverine" Steel Tape with open, aluminum reel, with nickel-plated brass folding handle. Leather strap on the reverse side by which the tape can be firmly held while winding. Extremely light and convenient, the 100-foot reel weighing but 8 ounces complete, yet sufficiently strong and durable to withstand the most severe usage. The aluminum is given a satin finish, which presents a beautiful appearance.

With one-quarter-inch Engineers' Pattern Tapes, which can be readily detached from the reel. Two detachable rings furnished.

		Length in feet	50	100
		Diameter of reel in inches	4 $\frac{1}{8}$	5 $\frac{1}{4}$
4043D	Divided in 10ths, each.....			
4043T	Divided in 12ths, each.....			
4043DL	Divided in 10ths and links, each.....			
4043TL	Divided in 12ths and links, each.....			



## SURVEYOR'S CHAIN TAPES



4045



## Description of Chain Tapes, showing graduations

Surveyor's Chain Tapes, with  $\frac{1}{4}$  inch wide steel ribbon, nicely finished hardwood reel, with large metal folding handle and two large detachable rings. Trimmings nicely nickel-plated. The frame and winding apparatus is strong, durable and compact, and can be conveniently carried in the pocket when the tape is in use. The tape can easily be detached from the frame, and is provided with two large and strong detachable handles or rings. When the tape is not in use these handles are fastened to the frame, where they will not get lost, and at the same time they serve as a convenient handle for carrying the complete tape.

The graduations are not made with rivets, which weaken the tape, or with soft metal, which makes it clumsy and wears off; but wherever graduated the steel has a bright, raised surface with the figures etched in. The steel being tempered and of the finest quality, the graduations and figures will never be effaced, but will always show clear and distinct.

Graduated every foot; end feet graduated to tenths or twelfths; and unless otherwise specified will be sent end feet in tenths.

		Length in feet	100	200	300
4045	Complete with reel, each.....				
4045A	Tape only, with two rings, each.....				
4045B	Plain reel only, each.....				
4045C	Rings only, per pair.....				

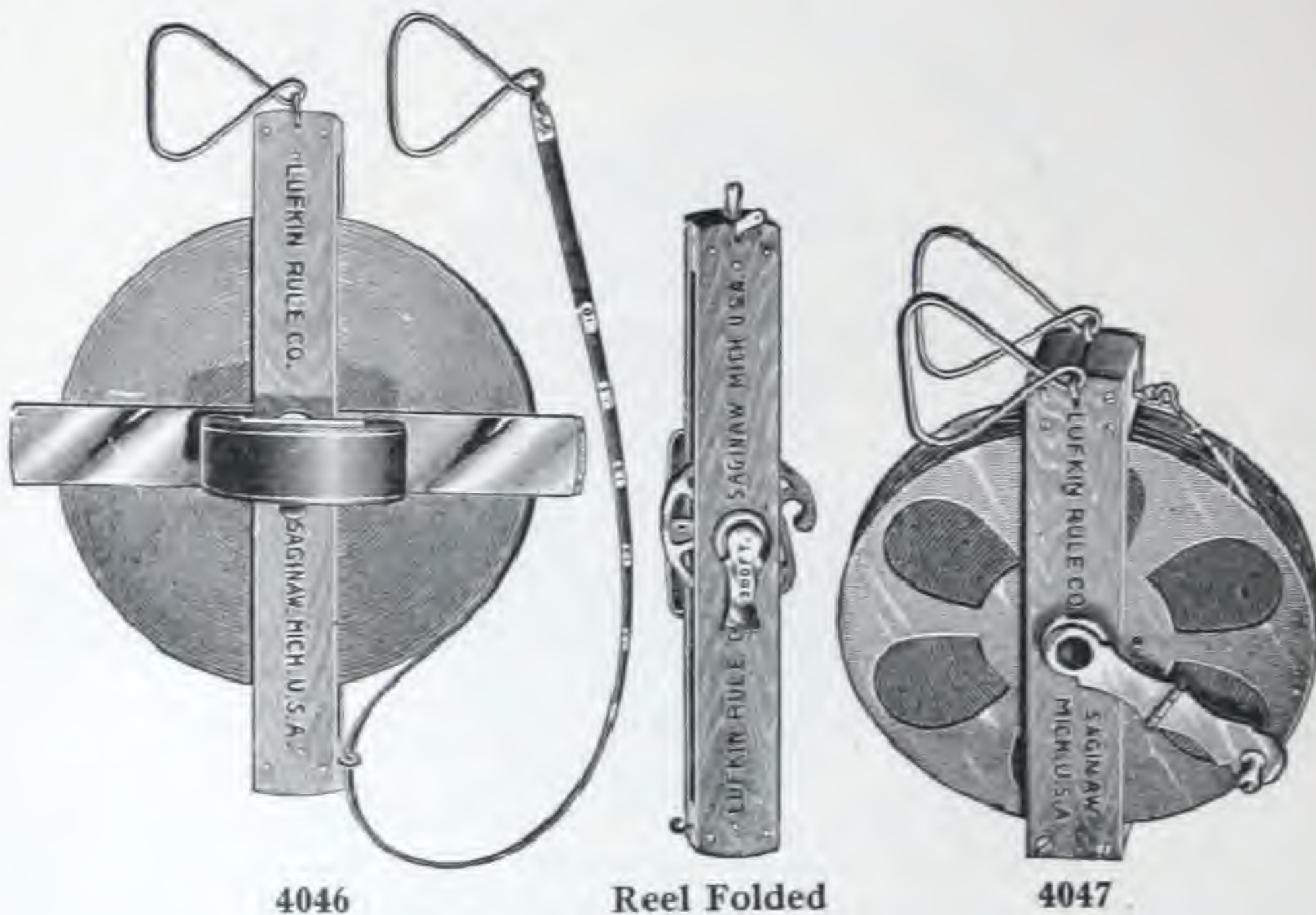
## ZINC PLATED CHAIN TAPES

We are also able to furnish regular Lufkin Chain Tapes, zinc plated. This is especially desirable in damp climates and localities where a common steel tape becomes affected by rust; otherwise description same as No. 4045.

	Length in feet	100	200	300	500
Prices in addition to list, as follows.....					



## SURVEYOR'S CHAIN TAPES—Continued.



The Chain Tape No. 4046 is the same as No. 4045, but the reel has steel crossarms, which keep the tape in place when winding or unwinding. When tape is in use and removed from the reel, the metal crossarms of the reel fold into the wooden frame, as shown above, so that even the large sizes can be conveniently carried in the pocket. The reel can be firmly held by placing the hand in the strong leather loop fastened to the side of the same.

	Length in feet	100	200	300	500
4046	Complete with reel, each.....				
4046A	Reel only, each.....				
4046B	Rings only, per pair.....				

Surveyor's Chain Tape, with heavy  $\frac{1}{8}$  inch wide steel ribbon, hardwood frame with substantial sheet steel open reel. Large metal folding winding handle and two large detachable rings, which can, for convenience of carrying, be fastened to the frame when the tape is not in use. One side of the frame is provided with a large and convenient leather loop for holding.

Graduated every foot, end foot in tenths, unless otherwise specified.

	Length in feet	100	200	300	500
4047	Complete with reel, each.....				
4047A	Reel only, each.....				
4047B	Rings only, per pair.....				

When ordering reel only, always specify length and width of chain tape to be used.

We promptly attend to any repairs on steel tapes and execute them in the most approved manner at a moderate charge.



## SURVEYOR'S CHAIN TAPES

Graduated on Babbitt Metal

This tape is designed to answer the requirements of the most severe usage, and to take the place of the old-time, yet indestructible, steel chain. It is made of practically unbreakable steel, heavily coated with white metal to prevent rusting and corrosion, and somewhat heavier than the ordinary chain tape.

Graduations are stamped into Babbitt Metal at each

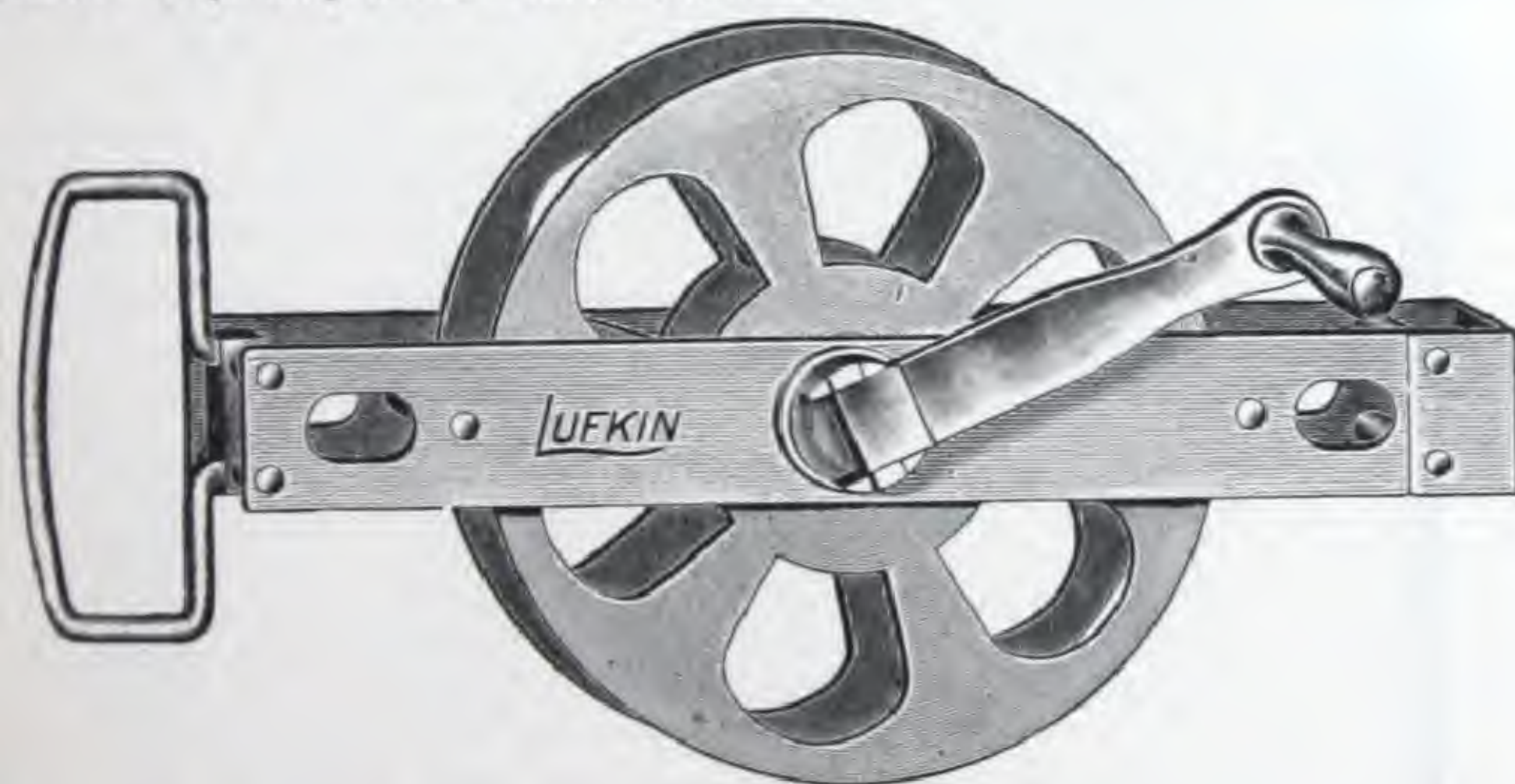
foot, end feet in tenths; or at each link, end links in tenths of links. Each tape is provided with a pair of detachable handles, or rawhide thongs, as desired.

Special attention is called to this reel, which is built especially for Babbitt Metal tapes. Nickel plated metal frame, with folding winding handle. A very serviceable reel, easily wound and of beautiful finish.

**Note**—All tapes 200 feet and longer are put up on Four Arm metal reels.

$\frac{3}{16}$  In. Wide or  $\frac{5}{16}$  In. Wide

	Length in feet.....	100	200	300	500
4049	Complete with reel, each.....				
4049A	Tape only without reel, each.....				

4049 $\frac{1}{2}$ 

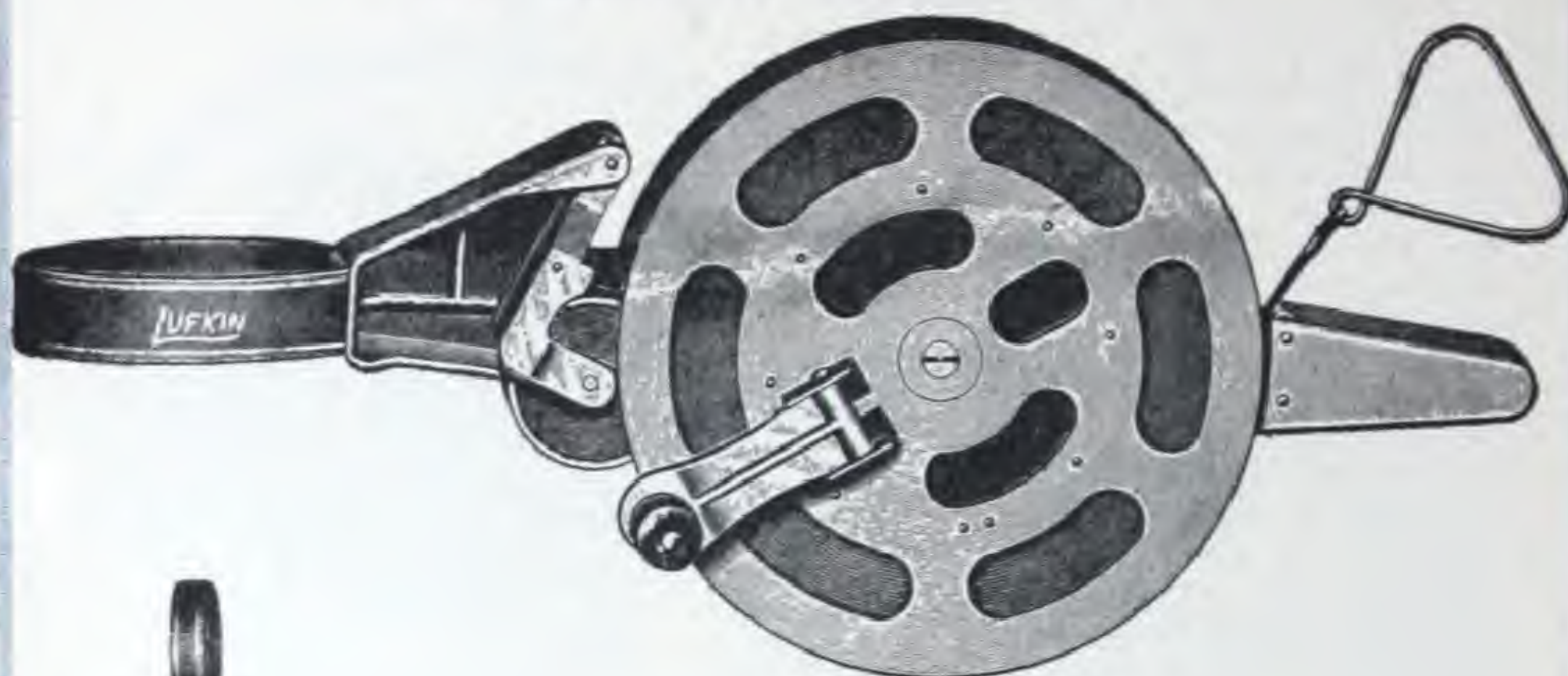
This reel is made of steel, the frame is 14 inches long with a flush folding 5 inch handle, and can be used for chain tape of any make.

EACH

4049 $\frac{1}{2}$	For tapes 100 feet long.....
4049 $\frac{1}{2}$ A	For tapes 200 to 300 feet long.....
4049 $\frac{1}{2}$ B	For tapes 500 feet long.....



## THE "CRIPPLE CREEK" REEL



4048

Patented February 4, 1902



4048 1/2

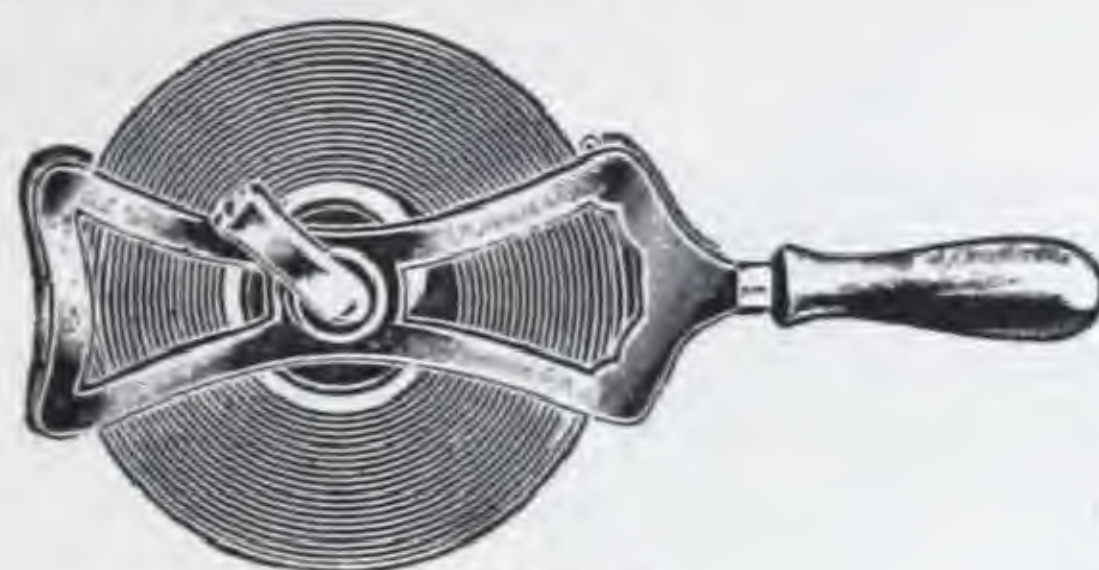
The "Cripple Creek" Reel has aluminum frame 14 inches long, nickel-plated steel reel, 8 inches in diameter. A boxwood roller or spool is fitted between the sides or discs of reel, which, by means of a spring, presses towards the axis of reel, causing tape to wind up evenly and tightly and keeping it in place. Long, neat and strong aluminum winding handle with large boxwood fingerhold, giving a winding leverage of nearly five inches, and enabling the winding of a long tape with exceptional ease and rapidity. The winding handle folds practically flush into the reel. A leather strap for carrying is attached to one end of the frame. It is especially designed for chain tapes and will carry an eighth-inch tape up to 1000 feet in length, and a quarter-inch tape up to 500 feet in length.

EACH

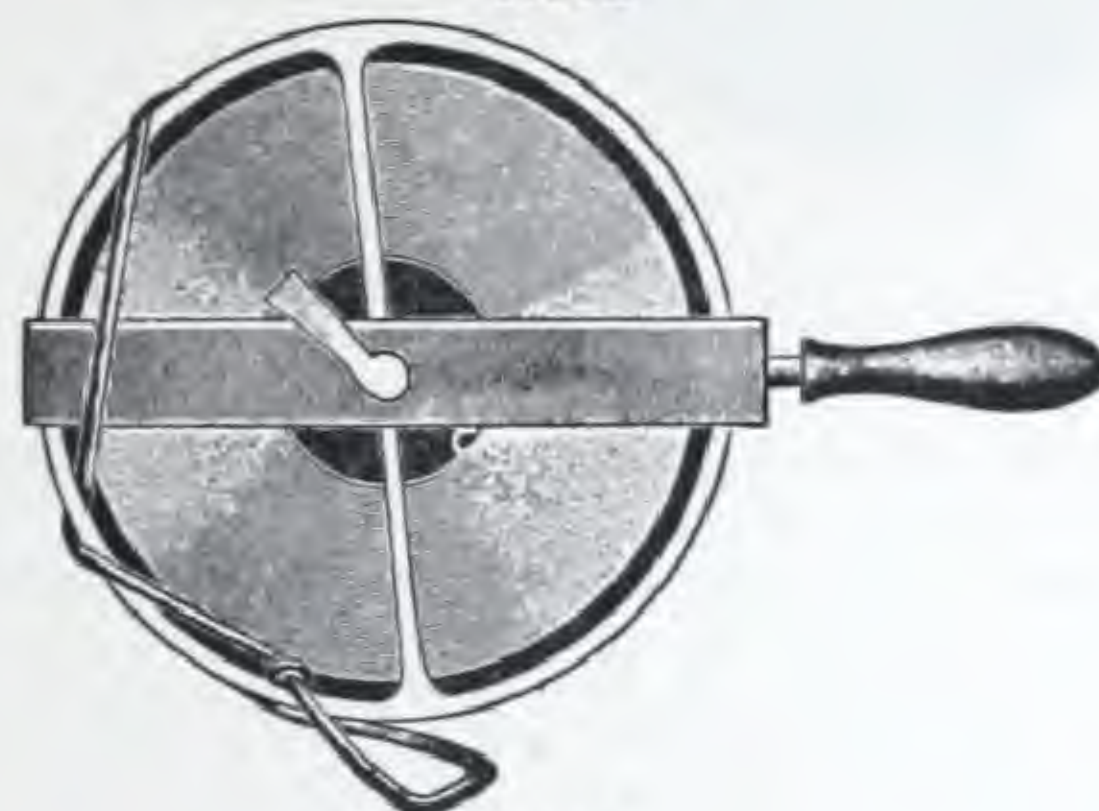
- 4048 The "Cripple Creek" Reel only.....\$
- 4048 1/2 Staff for "Cripple Creek" Reel 40 inches long, of hard maple wood, aluminum socket with heavy set screw at one end, into which the reel fits and is securely fastened. Other end of staff is tapered by means of a heavy brass ferrule and steel point, which can be firmly set into the ground. The great advantage of this staff is that it serves as a complete support in winding or unwinding the tape, and when the reel is not in use the outfit can be conveniently carried over the shoulder. Price of staff only.....



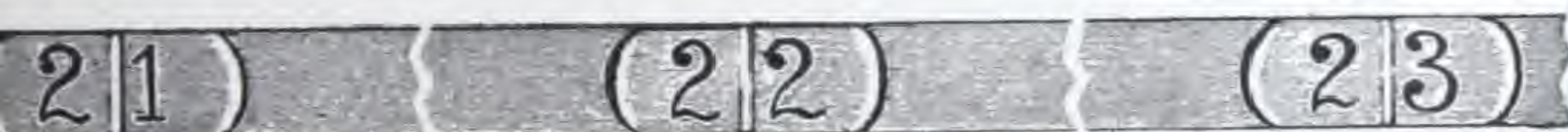
## CHICAGO STEEL TAPES



4050B



4052



Sample of Tape showing graduations on hard solder

Chicago Steel Tapes with  $\frac{3}{16}$ -inch wide steel ribbon, with metallic reel for short tapes and tapes without shoulders.

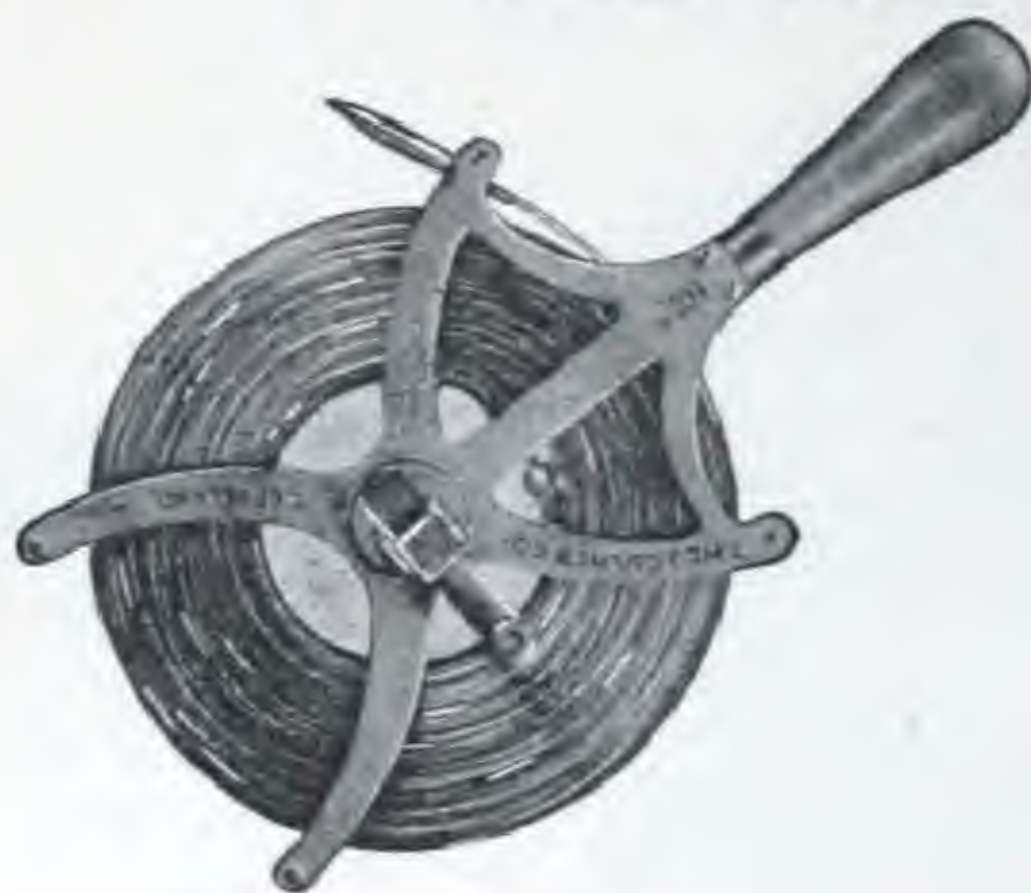
Graduations beginning at end of Steel Ribbon	Graduations beginning 6 ins. from end of Steel Ribbon	Length	Without Reel	With Metallic Reel
4050A	4051A	50 feet	\$ 3.75	\$ 5.30
4050B	4051B	100 feet	4.70	6.25
4050C	4051C	200 feet	7.50	11.25
4050D	4051D	300 feet	10.00	15.00
4050E	4051E	500 feet	16.25	22.50

$\frac{3}{16}$ -inch wide tape furnished if specified at the same price as above, without reel. EACH

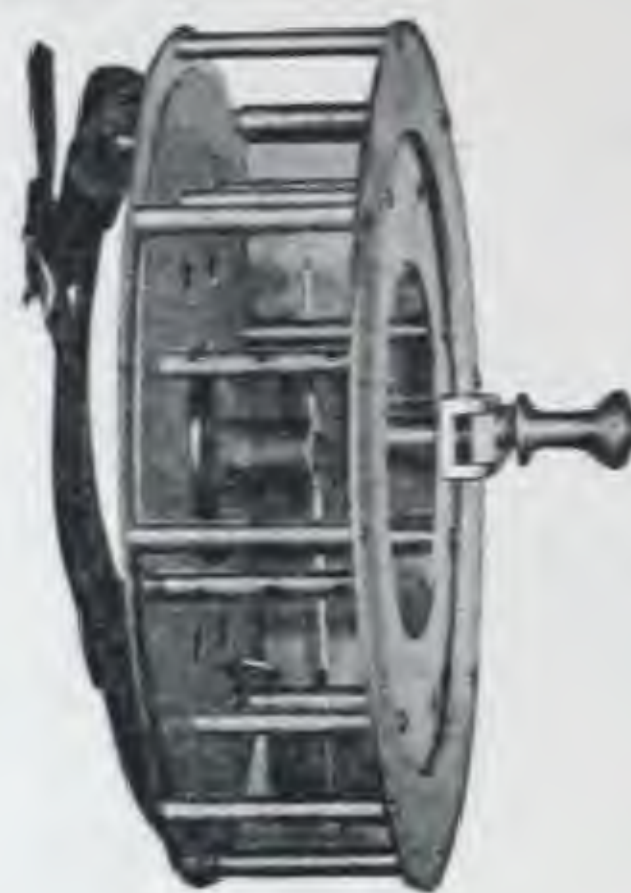
4052	Metal Reel only, for tape with shoulders for 100 foot tape.....	\$2.50
4053	Metal Reel only, for tape with shoulders for 200 foot tape.....	4.75
4054	Metal Reel only, for tape with shoulders for 300 foot tape.....	6.25
4055	Metal Reel only, for tape with shoulders for 500 foot tape.....	8.75



## LUCAS' STEEL CHAIN TAPES



101L



104L

The "Lucas" Chain Tapes have been appreciated by the users during the twenty-four years of their manufacture, and their sale has constantly increased until now they are used by engineers throughout the entire country.

None but the finest steel is used in their manufacture, and it is made expressly for this tape. It is so tempered that it can be wound into a coil of two inches in diameter, and will straighten out of its own accord; it can be wound tightly around a marking pin without breaking. It is plated with best anti-rust coating. The manufacturers will replace any "Lucas" Tape varying over 0.04 inch in 100 feet.

The numbers and graduations are made according to style of tape. Style E is graduated and figured every foot on German silver bands, which are tightly clasped around, riveted and soldered to the tape. Style D is graduated and figured every five feet, intermediate feet by small rivets, headed on both sides so as to offer the least resistance in dragging the tape over the ground; the holes punched for these rivets are about 0.035 inch in diameter, and therefore do not weaken the tape, but the smallest fraction; in fact, our tapes do not break once in a hundred times where the rivets are put in.

This tape is intended for rough usage, to take the place of the old-time chain. It is more accurate, neater, lighter, and does not get out of shape. It is just as accurate as the highest priced etched tape in the market, will stand more than three times the wear, and is much cheaper. You can tell at a glance just where you are.

Tension and temperature at which tape is standard, sent with each tape. In ordering, care should be taken to specify the style by letter and number.

STYLE	TAPE 15-64 INCH WIDE	EACH
D	100 feet, graduated to feet, each five feet by soldered bands marked with figures, intermediate feet by rivets, each end foot to tenths	
D1	101 feet, same as D, but with extra end foot graduated to tenths.	
E	100 feet, with soldered bands, figured every foot, each end foot to tenths.	
E1	101 feet, same as E, but with extra end foot graduated to tenths.	

A pair of spring ring handles accompanies every tape. For reels for foregoing tapes, see cuts of 100-foot reels. All tapes plated with antirust coating.

Styles D1 and E1 have an extra foot beyond the zero, graduated to tenths of a foot, making the tape 101 feet long. This is convenient, as all the readings are plus. In ordering, care should be taken to specify styles as marked. It will avoid delays resulting from misunderstanding of order.

**Prices on Lucas Tapes do not include reel**



## LUCAS' STEEL MEASURING TAPES—Continued.

## LUCAS' NARROW CHAIN TAPES

$\frac{1}{8}$ -inch wide. All tapes plated with antirust coating, graduations and figures being on German silver bands clasped and soldered around the tape.

STYLE	EACH
M 100 feet, marked by bands every foot, same style as E.....	
M 200 feet, marked by bands every foot, same style as E.....	
M 300 feet, marked by bands every foot, same style as E.....	
M 400 feet, marked by bands every foot, same style as E.....	
M 500 feet, marked by bands every foot, same style as E.....	
O 200 feet, marked every 10 feet, end 10 feet to feet, each end foot to tenths.....	
O 300 feet, marked every 10 feet, end 10 feet to feet, each end foot to tenths.....	
O 400 feet, marked every 10 feet, end 10 feet to feet, each end foot to tenths.....	
O 500 feet, marked every 10 feet, end 10 feet to feet, each end foot to tenths.....	
P 200 feet, marked every 5 feet, end 5 feet to feet, each end foot to tenths.....	
P 300 feet, marked every 5 feet, end 5 feet to feet, each end foot to tenths.....	
P 400 feet, marked every 5 feet, end 5 feet to feet, each end foot to tenths.....	
P 500 feet, marked every 5 feet, end 5 feet to feet, each end foot to tenths.....	
R 1000 feet, marked every 50 feet, end 50 to 10, end 10 to feet, each end foot to tenths.....	

Extra end foot at each end marked in tenths on all the above tapes, unless otherwise ordered.

Style R made only to order.

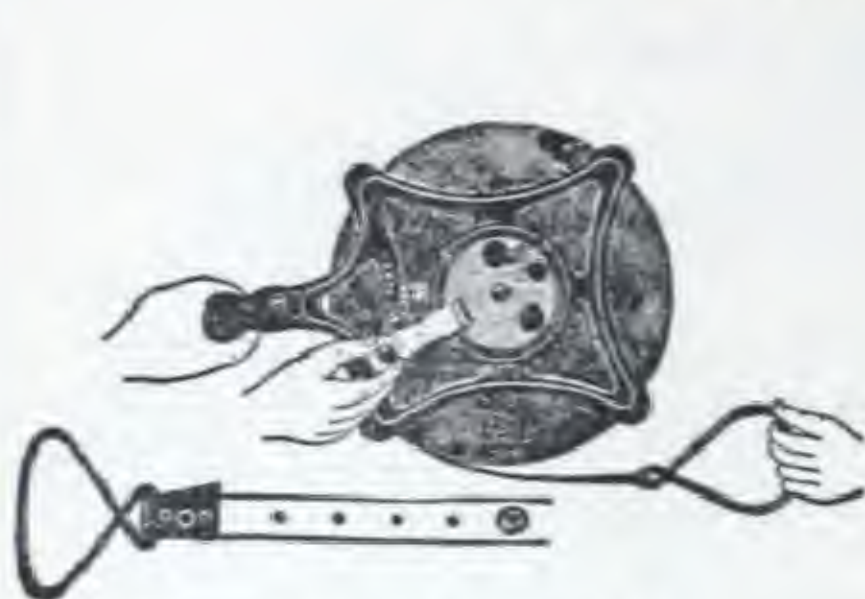
## REELS FOR LUCAS' STEEL CHAIN TAPES

	EACH
101L Frame Cast Brass Reel, for 50 to 100-foot tapes. This reel is very durable and strong, as well as light. Tape is easily removed when reel is not needed.....	
104L Large Improved Cast Brass, center grip, take-down Reel, folding handle, stop, friction brake, tension spring and leather hand guard, $7\frac{1}{2}$ -inch winding drum. Will take 500 feet and over of $\frac{1}{8}$ -inch tape, and only takes 240 revolutions to wind 500 feet of tape.....	

See cuts of above reels on preceding page.



## ROE'S STEEL CHAIN TAPES



50 and 100 Foot Style



200 Foot Style



300 Foot Style

These Tapes are made of superior steel, made to order especially for the purpose, are about  $\frac{1}{4}$  inch wide, are graduated every foot or link by brass rivets, and each end foot in tenths or inches. Every 5 feet or link has a brass clasp with numbers, and every 10 feet or link has a copper clasp with numbers indelibly stamped on both sides thereon. Instructions are sent with every tape and reel how to use them to best advantage. No matter how dirty or rusty the tape may be, the rivets, clasps and figures can be plainly seen. These tapes have detachable handles so as not to catch anywhere when drawn through brush, and are wound up on an "electric" reel. This reel allows the entire tape open to dry, and the tape can be reeled or unreel as easily and rapidly as the linen or metallic tapes in cases. The tape can also be detached very easily and used without a reel.

The aluminum tapes are much less liable to rust, and require no oiling or cleaning after being used.

ALUMINUM  
PLAIN PLATED

4060	50 feet long, every foot.	End foot in tenths.....
4061	50 feet long, every foot.	End foot in inches.....
4062	100 feet long, every foot.	End foot in tenths.....
4063	100 feet long, every foot.	End foot in inches.....
4064	100 feet long, every 5 feet.	End foot in tenths.....
4065	100 feet long, every 5 feet.	End foot in inches.....
4066	200 feet long, every foot.	End foot in tenths.....
4067	200 feet long, every foot.	End foot in inches.....
4068	200 feet long, every 5 feet.	End foot in tenths.....
4069	200 feet long, every 5 feet.	End foot in inches.....
4070	300 feet long, every foot.	End foot in tenths.....
4071	300 feet long, every foot.	End foot in inches.....
4072	300 feet long, every 5 feet.	End foot in tenths.....
4073	300 feet long, every 5 feet.	End foot in inches.....
4074	400 feet long, every foot.	End foot in tenths.....
4075	400 feet long, every foot.	End foot in inches.....
4076	400 feet long, every 5 feet.	End foot in tenths.....
4077	400 feet long, every 5 feet.	End foot in inches.....
4078	500 feet long, every foot.	End foot in tenths.....
4079	500 feet long, every foot.	End foot in inches.....
4080	500 feet long, every 5 feet.	End foot in tenths.....
4081	500 feet long, every 5 feet.	End foot in inches.....

EACH

4082	Electric Reel, without tape, for 50 and 100 feet.....
4083	Electric Reel, without tape, for 200 feet.....
4084	Electric Reel, without tape, for 300 feet.....

PER PAIR

4085	Brass, detachable handles.....
------	--------------------------------



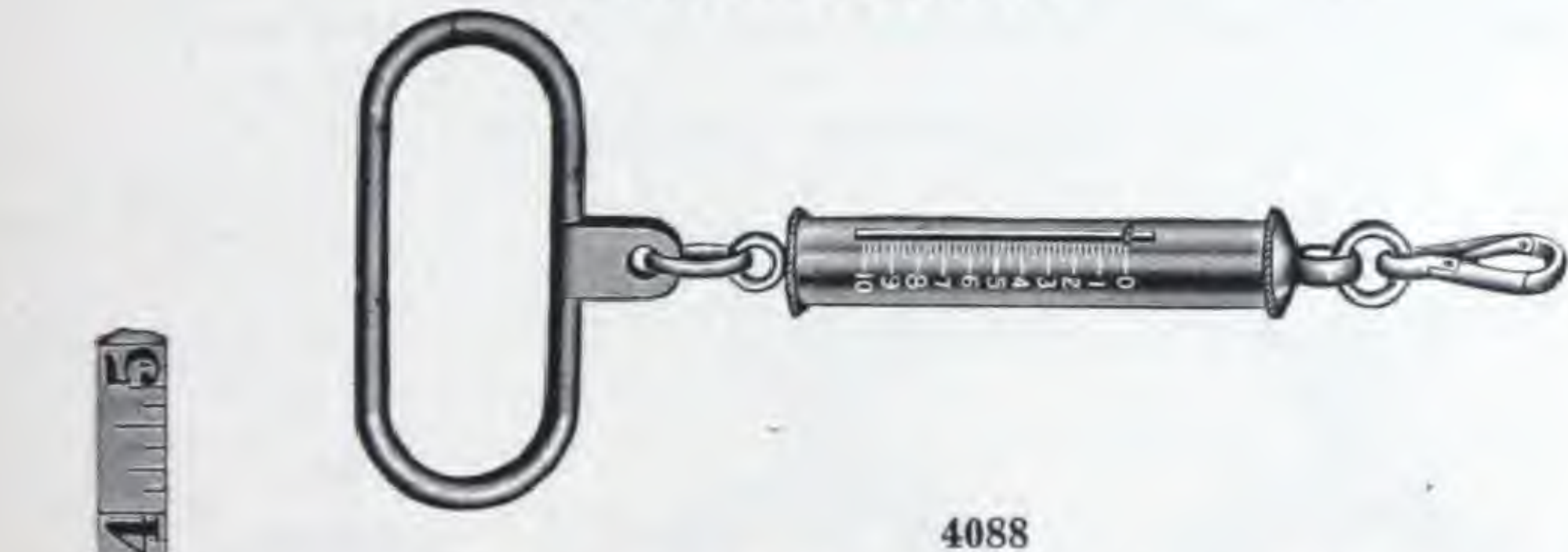
TAPE HOOKS AND CLAMP HANDLES



Tape Hooks, for attaching to steel tapes. These measure from inside of hook.

		EACH
4086	Tape Hooks, for 1/4-inch tapes.....	
4086A	Tape Hooks, for 3/8-inch tapes.....	
4087	Tape Grip, nickel plated.....	

TENSION HANDLES



Tension Handles, for applying the exact tension at which a steel tape is standard. Brass, nicely nickel plated, indicating tension up to 20 pounds by half pounds.

		EACH
4088	Tension Handles.....	\$

PLUMB BOB ATTACHMENT  
FOR STEEL TAPES

These are used in oil fields for gauging oil tanks, and this attachment is included in the measurement of the tapes. The Plumb Bobs are nickel plated and provided with a detachable clip for fastening to the tape. We can furnish these for any of the Engineer's, Lock Handle and Standard Frame Tapes shown on pages 256, 257 and 258.

		EACH
4089	Plumb Bob Attachment, extra.....	



## ARROWS



4100

PER SET

- 4100 Steel Arrows, 11 in set, 10 inches long, W. G. 6.....  
 4101 Steel Arrows, 11 in set, 14 inches long, W. G. 6.....  
 4102 Iron Arrows, 11 in set, 14 inches long, W. G. 10.....  
 4104 Red and White Arrows, 11 in set, 14 inches long.....  
 4106 Leather Quiver, with belt loop, for set of arrows, 12 or 14 inches, each

## TALLYING MACHINES



4107



4108



4109

EACH

- 4107 Tallying Machine, for keeping count by pressing on a knob, nickel-plated watchcase, porcelain dial, three numbered dials registers to 1000, with lever for setting hands to zero.....  
 4108 Tallying Machine, for keeping count by pressing on a knob, nickel-plated watchcase, porcelain dial, but with four numbered dials, registers to 10,000.....  
 4109 Tallying Machine, for keeping count by pressing on a knob, nickel-plated, registers to 999, arranged to set back to zero.....



## STAKE TACKS AND MINE SPADS



4110 4112 4113 4114 EACH

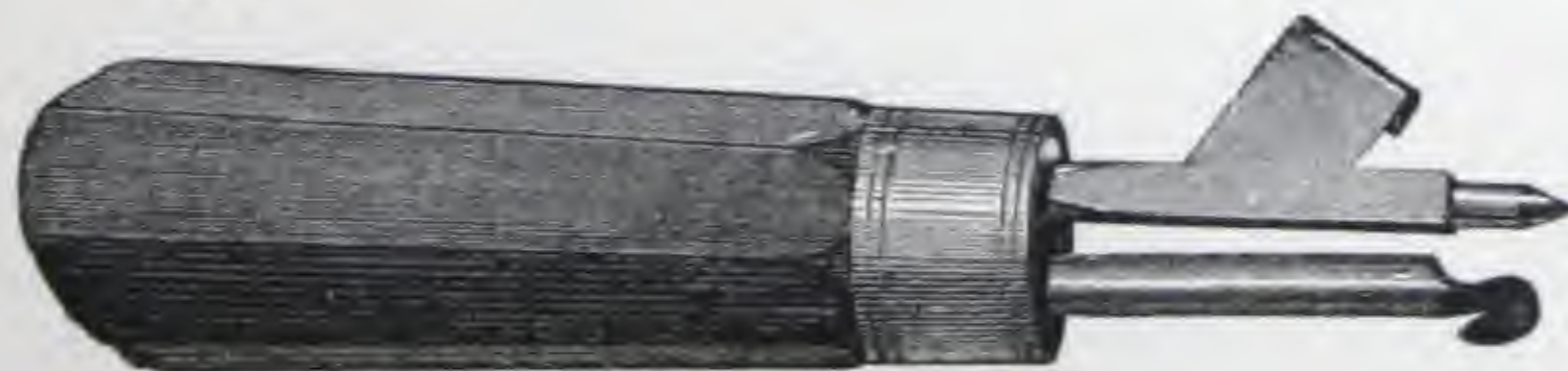
- 4110 Stake Tacks, galvanized or brassed, per 2-ounce boxes. . . . .
- 4111 Stake Tacks, galvanized or brassed, per pound boxes. . . . .
- These tacks have an indentation in the surface of the head, to guide the point of the plumb bob in exactly indicating location. PER GROSS
- 4112 Mine Spads,  $2\frac{1}{2}$  inches long, for suspending plumb bob from timbers in mines, in gross boxes. . . . .
- 4113 Mine Spads, 2 inches long, for suspending plumb bob from timbers in mines, in gross boxes. . . . .
- 4114 Mine Spads,  $1\frac{1}{4}$  inches long, for suspending plumb bob from timbers in mines, in gross boxes. . . . .

Note—4113 and 4114 can be furnished in non-rust finish at a small additional cost.

## TIMBER SCRIBES



4115

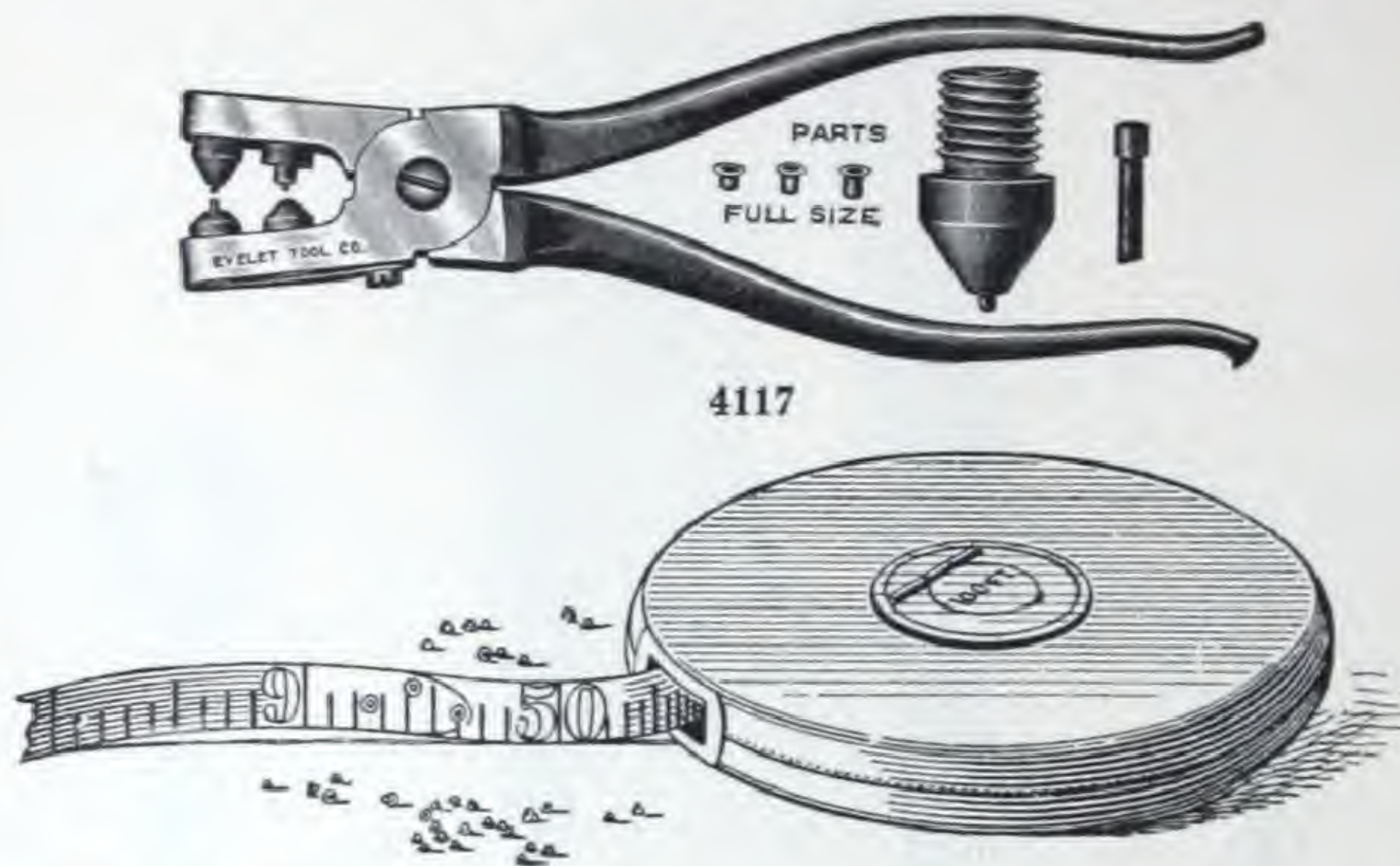


4116

- 4115 Timber Scribe, 5 inch, for marking on wood, small. . . . .
- 4116 Timber Scribe,  $6\frac{1}{2}$  inch, for marking on wood, large. . . . .



## TAPE REPAIR OUTFITS



4117

The "Punch and Riveter" set for Repairing Steel Tapes. Five minutes only required to mend an ordinary break

Can be carried in instrument box, thus enabling an engineering corps to repair their broken tapes in the field with the loss of a few minutes' time. Cuts a clean hole through two thicknesses of steel tape without drawing the temper. No filing required, holes can be cut near the extreme edge without splitting the tape, thus avoiding any chance of dirt collecting under the splice, cutting the fingers when drawing tape through the hands, or catching in rags when cleaning, etc.

EACH

- 4117 Combined Punch and Riveter, including supply long and short brass rivets.....  
 4118 Brass Rivets, 500 long and 500 short.....



4119

## PUNCH, SHEARS AND RIVET SET

This tool combines all the necessary features to repair steel tapes in the shortest time and the neatest way. The punch will cut through two thicknesses of Lufkin or Chesterman's Tapes or one thickness of the heavy chain tape.

EACH

- 4119 Combined Punch, Shears and Riveter set, including supply long and short brass rivets.....  
 4120 Brass Rivets, 500 long and 500 short.....



## TAPE SPLICES



As Furnished



As Applied

4121

- 4121 Weldin Tape Splice, for  $\frac{1}{8}$ ,  $\frac{3}{16}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ -inch tapes. . . . . \$  
 The Weldin is the best and most easily applied tape splice on the market.



4122

This splice consists of a thin sheet of metal folded in the shape of a sleeve and coated with a combination of solder and flux so sensitive that the head of a common lighted match will bring about a perfect adhesion between tape and sleeve. The repair can be made in the field in a minute and look as neat as if done by a jeweler and as strong as a blacksmith could do it. No rivets or soldering irons required.

Sleeves are furnished one dozen in a small wooden box with directions.

In ordering state width of tape.

PER DOZ.

- 4122 Eureka Tape Splices, sleeves. . . . .



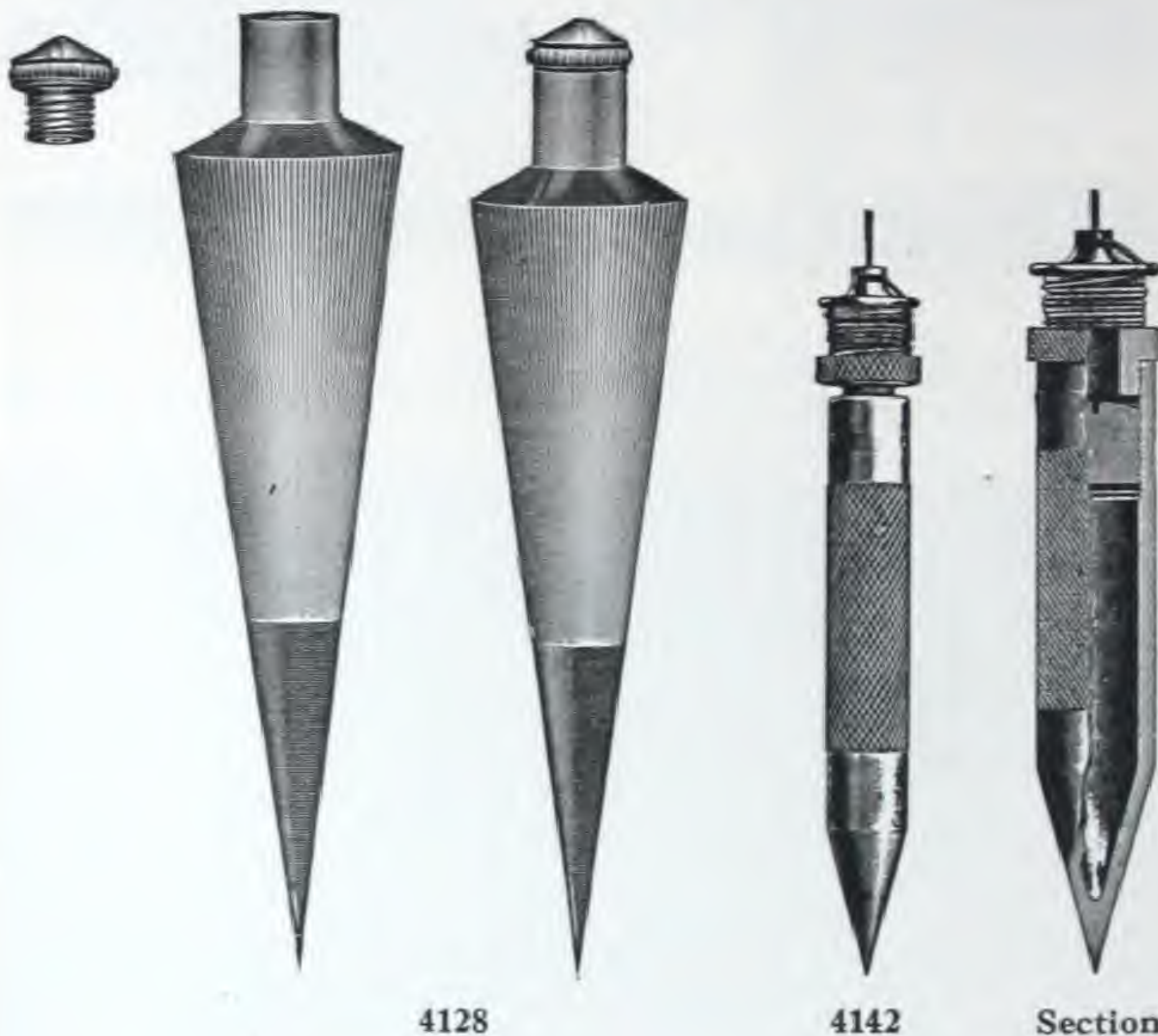
4123

EACH PER DOZ.

- 4123 Little Giant Tape Splice, for  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ -inch tapes. . . . .



## PLUMB BOBS



EACH

- 4125 Brass Plumb Bob, about 6 ounces, steel point, screw cap. ....  
 4126 Brass Plumb Bob, about 8 ounces, steel point, screw cap. ....  
 4127 Brass Plumb Bob, about 10 ounces, steel point, screw cap. ....  
 4128 Brass Plumb Bob, about 12 ounces, steel point, screw cap. ....  
 4129 Brass Plumb Bob, about 14 ounces, steel point, screw cap. ....  
 4130 Brass Plumb Bob, about 16 ounces, steel point, screw cap. ....  
 4131 Brass Plumb Bob, about 19 ounces, steel point, screw cap. ....  
 4132 Brass Plumb Bob, about 24 ounces, steel point, screw cap. ....

Other weights furnished to order.

- 4140 Mercury Plumb Bob, 3½ ounces, 4 inches long, ½ inch diameter.  
 4141 Mercury Plumb Bob, 6 ounces, 4½ inches long, ⅝ inch diameter.  
 4142 Mercury Plumb Bob, 12 ounces, 5⅜ inches long, ⅞ inch diameter.  
 4143 Mercury Plumb Bob, 16 ounces, 6 inches long, 1 inch diameter.

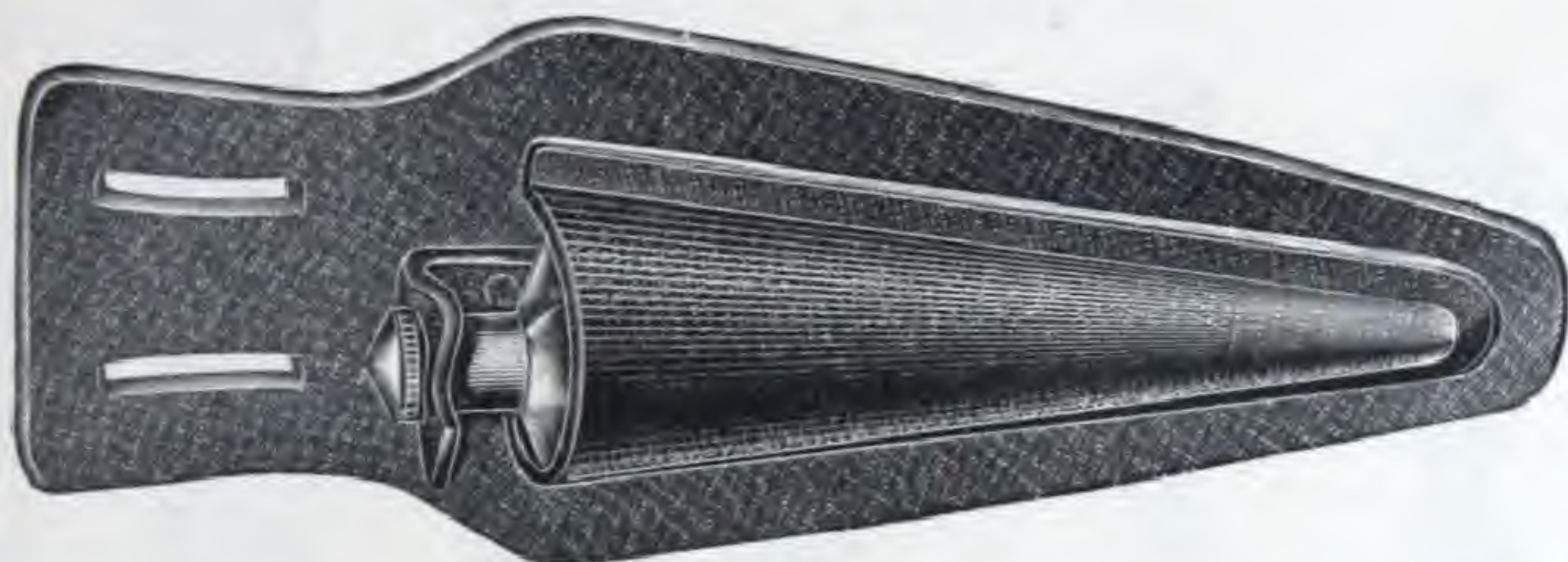
## Plumb Bob Line

PER REEL  
OF 25 YDS.

- 4146 Plumb Bob Line, best linen, thin, medium or thick. ....  
 4147 Plumb Bob Line, best braided silk. ....



## PLUMB BOB SHEATHS



4148

EACH

- 4148 Small Size Sheaths, heavy black leather, for 6 and 8 ounce bobs..
- 4148A Medium Size Sheaths, heavy black leather, for 10 and 12 ounce bobs.....
- 4148B Large Size Sheaths, heavy black leather, for 14, 16, and 19 ounce bobs.....

## PLUMB BOB TARGET



EACH

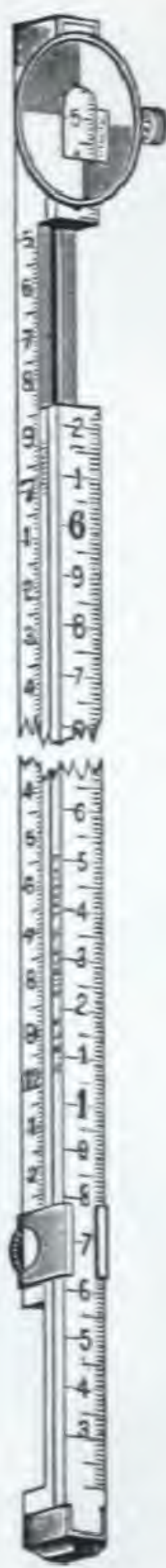
- 4149 Plumb Bob Target.....



## LEVELING RODS



4152



4160



4161



4163



4162

Description and Price List on next page

"Oval" Target can be furnished on all Philadelphia Rods, if desired, at an additional charge.

Rolling Angle Target can be furnished on all Philadelphia Rods, if desired, at an additional charge.



## LEVELING RODS—Continued.

See illustrations on preceding page

EACH

- 4150 "Philadelphia Rod," hardwood, divided feet and 10ths, vernier reading to 100ths, with target, vernier and clamp, 7 feet, sliding out to 13 feet.....
- 4151 "Philadelphia Rod," same as No. 4150, but divided in half 10ths.
- 4152 "Philadelphia Rod," same as No. 4150, but divided into feet, 10ths and 100ths, vernier reading to 1000ths.....
- 4153 "Light Philadelphia Rod," hardwood, divided feet and 10ths, vernier reading to 100ths, with target, vernier and clamp, 6½ feet, sliding out to 12 feet.....
- 4154 "Philadelphia Rod," same as No. 4153, but divided in half 10ths
- 4155 "Light Philadelphia Rod," same as No. 4153, but divided into feet, 10ths and 100ths, vernier reading to 1000ths.....
- 4156 "Philadelphia Mining Rod," hardwood, divided into feet and 10ths, vernier reading to 100ths, with target, vernier and clamp, 3 feet, sliding out to 5 feet\*.....
- 4157 "Philadelphia Mining Rod," same as No. 4156, but divided into feet, 10ths and 100ths, vernier reading to 1000ths\*.....
- 4158 "Philadelphia Mining Rod," hardwood, divided into feet and 10ths, vernier reading to 100ths, with target, vernier and clamp, 5 feet, sliding out to 9 feet\*.....
- 4159 "Philadelphia Mining Rod," same as No. 4158, but divided into feet, 10ths and 100ths, vernier reading to 1000ths\*.....
- 4160 "New York Rod," hardwood, light color, divided into feet, 10ths and 100ths, vernier reading to 1000ths, with target, vernier and clamp, 6½ feet, sliding out to 12 feet.....
- 4161 "Architect's Rod," hardwood, light color, divided into feet, inches and ⅛ inches, with target, vernier and clamp, 5½ feet, sliding out to 10 feet.....
- 4162 "Stadia Rod," without target, hinge joint, 6 feet folded, unfolding to 12 feet, graduated to feet, 10ths and 100ths.....
- 4163 "Cross Section Rod," 10 feet, divided into feet, 10ths and 100ths on both sides, level vial at each end, and opening for the hand

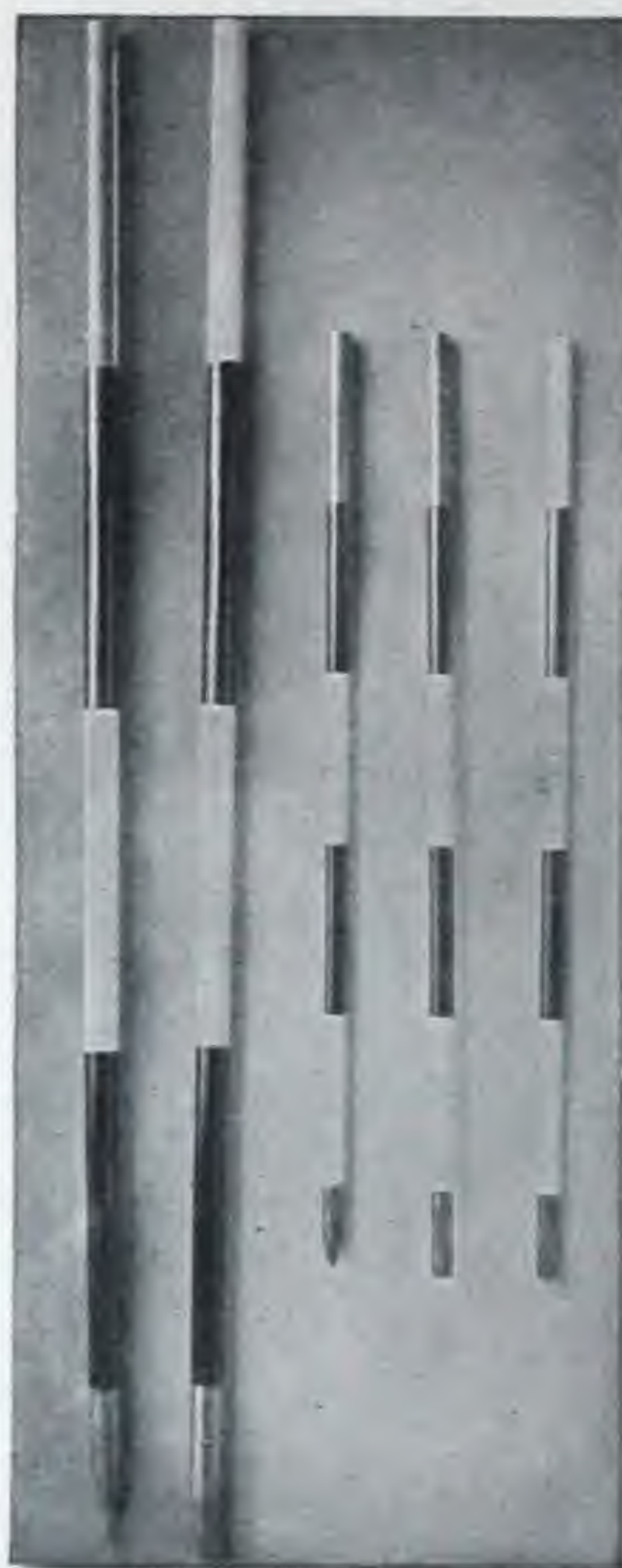
\*Philadelphia Mining Rods, same description as above, length 4 feet, sliding out to 7 feet, can be furnished, if desired.



## RANGING POLES



4165



4169

4170

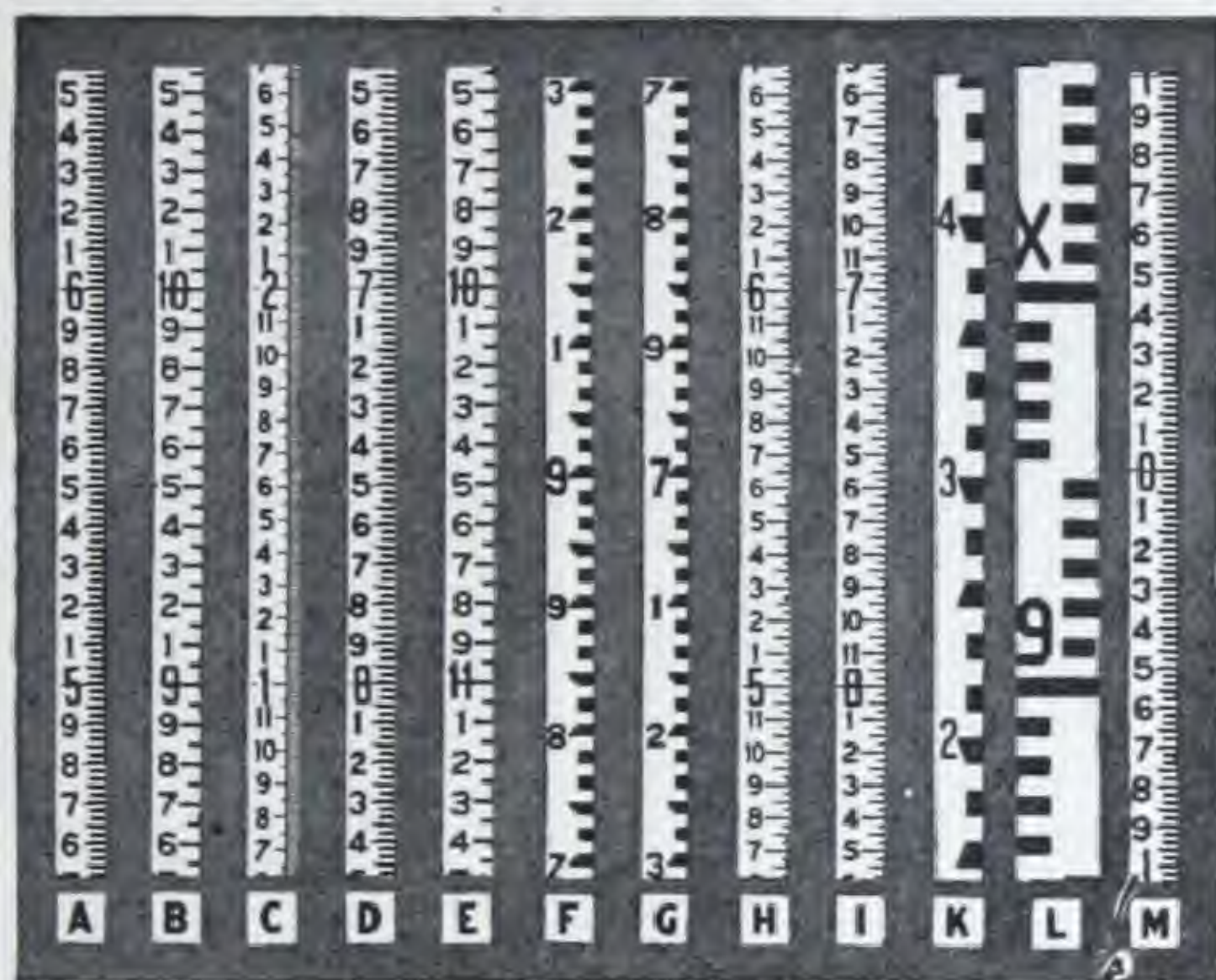
"Ranging Poles," best seasoned wood, painted red and white alternately.  
Length in feet..... 6 8 10

- 4165 Octagonal.....  
4166 Round.....  
4167 Steel Ranging Poles (solid), round,  $\frac{1}{2}$  inch diameter, with hardened point, painted red and white alternately every foot.  
Length in feet..... 6 8  
Each.....  
4168 Steel Ranging Poles (solid) octagonal,  $\frac{1}{2}$  inch diameter, with hardened point, painted red and white alternately every foot.  
Length in feet..... 6 8  
Each.....  
4169 Steel Ranging Poles (tubular), round, two parts, with telescope joints,  $1\frac{1}{16}$  inches in diameter, with hardened point, painted red and white alternately every foot. Made in one length,  $8\frac{1}{2}$  feet.  
4170 Steel Ranging Poles (tubular) round, three parts, with telescope joints,  $7\frac{1}{4}$  feet long,  $\frac{5}{8}$ -inch diameter with hardened point, painted red and white alternately every foot.



## FLEXIBLE POCKET LEVEL RODS

Paper Cloth



4170 A to M

12½ ft.      12½ ft.      16½ ft.  
or under    to 16½ ft.    to 20½ ft.

- 4170A** Feet, 10ths and 100ths, numbering up, width 1½ or 1¼ in., Each . . . .
- 4170B** Feet, 10ths and half 10ths, numbering up, width 1½ or 1¼ in., Each . . . .
- 4170C** Feet, inches and eighths, numbering up, width 1½ or 1¼ in., Each . . . .
- 4170D** Feet, 10ths and 100ths, numbering down, width 1½ or 1¼ in., Each . .
- 4170E** Feet, 10ths and half 10ths, numbering down, width 1½ or 1¼ in., Each . . . . .
- 4170F** Meters, 10ths and 100ths, numbering up, Each . . . . .
- 4170G** Meters, 10ths and 100ths, numbering down, Each . . . . .
- 4170H** Feet, inches and fourths, numbering up, Each . . . . .
- 4170I** Feet, inches and fourths, numbering down, Each . . . . .
- 4170K** Links and 10ths, numbering up, Each . . . . .
- 4170L** Feet and half 10ths, 2½ inches wide, Each . . . . .
- 4170M** Any style numbering both ways from a zero, Each . . . . .



## SECTIONAL LEVELING RODS



4175A

4175B



4177

Made in either three or four sections, light in weight, is joined with rectangular metal tubing, locked with an automatic spring catch, which makes the rod very rigid. The rod is faced with a printed leveling rod ribbon, which is varnished and will keep legible as long as a painted face, but can be refaced with another ribbon in a few minutes, with the aid of a tube of LePage's Glue.

Use the letters A or B in connection with the list numbers 4175 or 4176 in specifying the Sectional Rod desired.

	EACH
4175 12½-foot rod, in 3 sections, without target.....	\$ 9.00
4176 16½-foot rod, in 4 sections, without target.....	12.00
4176½ Leveling Rod Target, 5½-inch diameter.....	1.00
4177 Rod Level, Circular Spirit Level.....	3.00



## POCKET MAGNETIC COMPASSES



(Actual size)  
4180

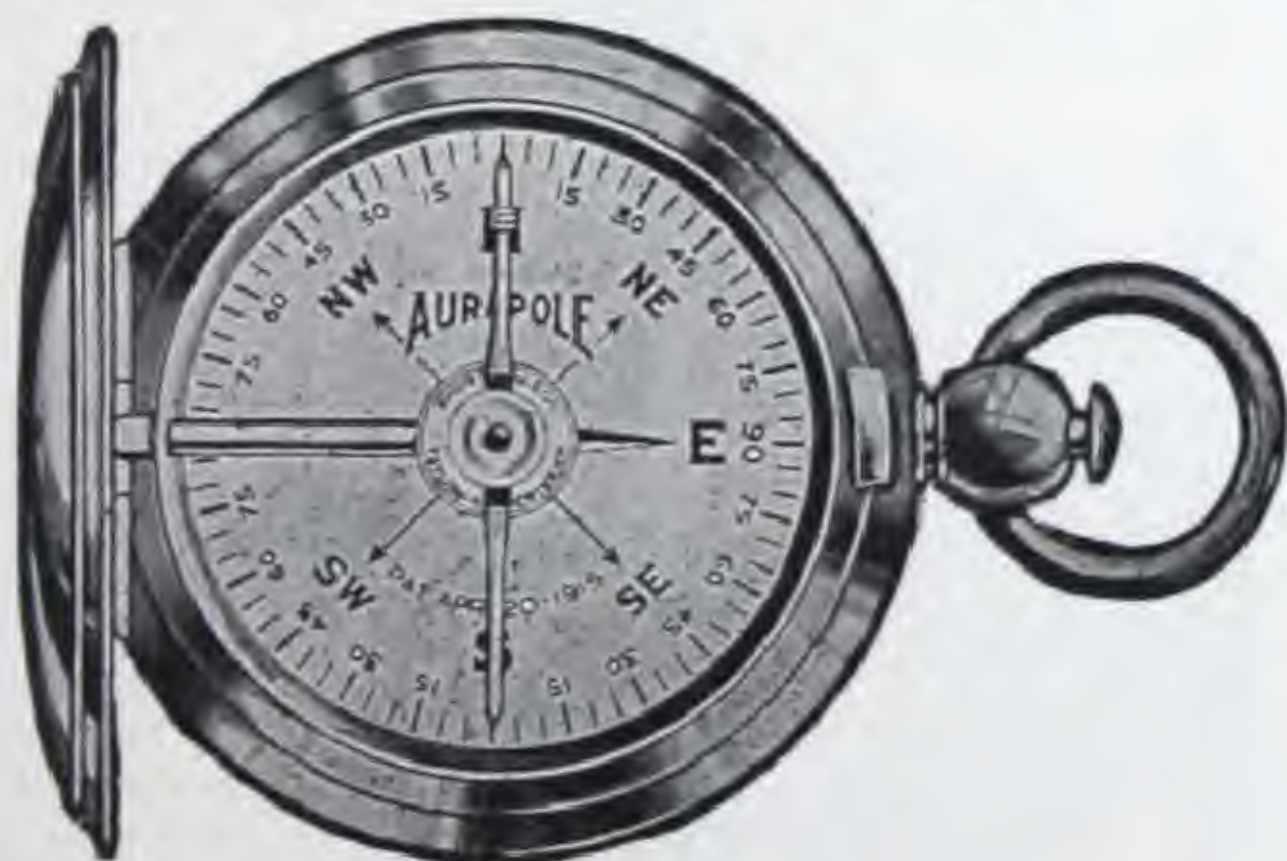


(Actual size)  
4181

EACH

- 4180 Leedawl Compass, white-metal case, beveled-glass crystal, jeweled needle with stop, untarnishable silvered metal dial, cupped jewel bearing.....
- 4181 Magnapole Compass, white metal case, beveled glass crystal, aluminum dial, jewel center bar needle with stop.....

## Hunter Case, Secret Spring, Nickel Case



(Actual size)  
4182

EACH

- 4182 Aurapole Compass, thin model, white metal hunter case, strongly hinged, beveled glass crystal, bar needle with jeweled center, automatic stop lift, untarnishable aluminum dial. Packed each in an attractive box.....
- 4183 Aurapole Compass, same as No. 4182 except in gold filled case.....

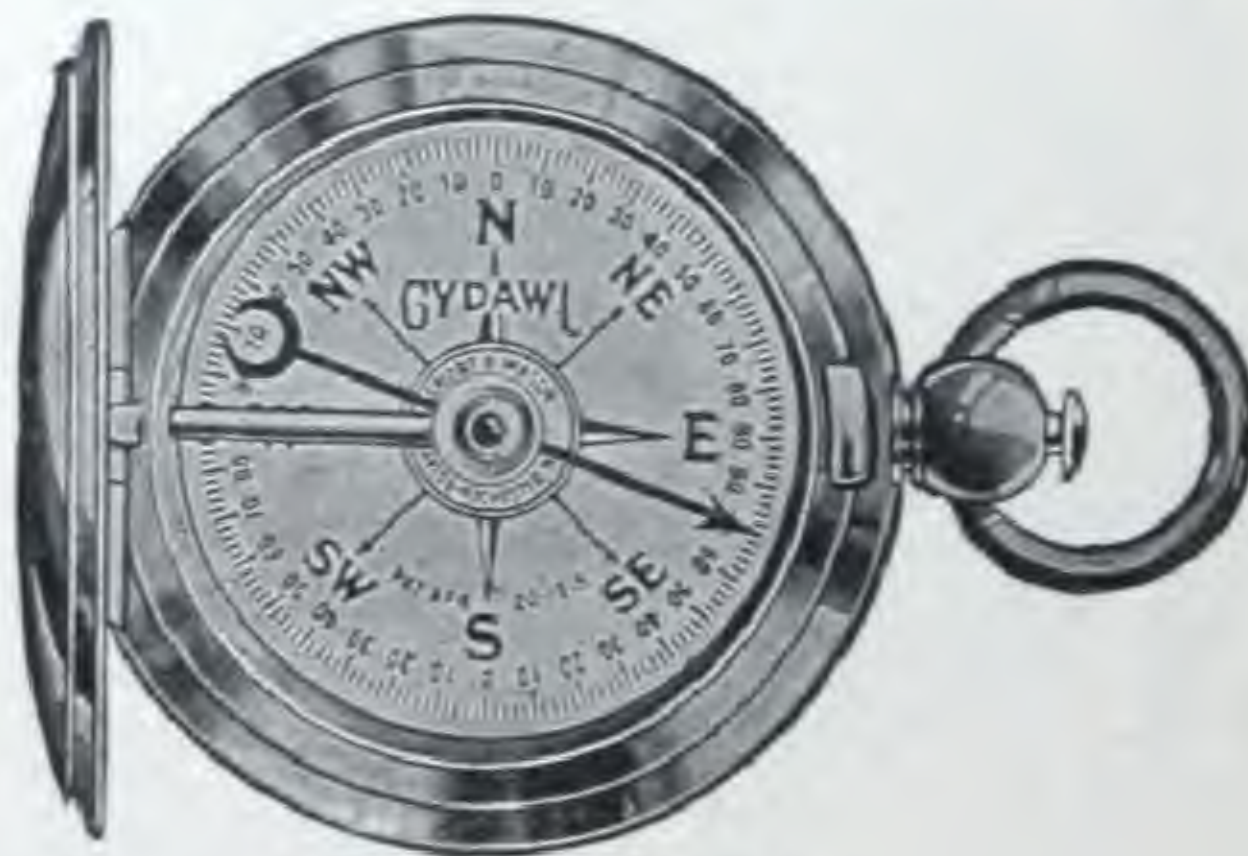


## POCKET MAGNETIC COMPASSES—Continued

(Actual size)  
4184(Actual size)  
4185

- 4184 Ceebynite Compass, thin model, white metal hunter case, strongly hinged, beveled glass crystal, floating aluminum dial with luminous points, cupped jewel center, automatic stop lift. Packed each in an attractive box. . . . .
- 4185 Usanite Compass, thin model, white metal hunter case, strongly hinged, beveled glass crystal, automatic stop lift, silvered metal dial, with jeweled center bar needle with luminous points. Packed each in an attractive box. . . . .

EACH

(Actual size)  
4186

- 4186 Gydawl Compass, thin model, white metal hunter case, strongly hinged, beveled glass crystal, flat half blued steel needle with jeweled center, automatic stop lift, untarnishable silver metal dial. Packed each in an attractive box. . . . .

EACH



## SURVEYING AND SIGHT COMPASSES



4201

This type of Single Compass is an excellent instrument for approximate work. Especially adaptable for reconnaissance and preliminary surveying. It is made in a thoroughly substantial manner, enabling it to withstand the rough usage commonly occurring in this class of work. The exact magnetic variation can be obtained by revolving the inner circle (showing 30 degrees from 0 either east or west) by means of its milled edge. A vernier is also attached for closer reading. The No. 4201 (specially recommended) compass is fitted with a 4½-inch best bar needle, jeweled center and stop, a ball and socket mounting (Jacob Staff) complete in a specially braced block sling leather case. (Weight of 5-inch instrument, including case, 36 ounce.)

EACH

- 4200 3½-inch Surveying Compass, with ball and socket Jacob Staff fitting, in special leather sling case. ....
- 4201 5-inch Surveying Compass, with ball and socket Jacob Staff fitting, in special leather sling case. ....



# VERNIER COMPASSES

Two Sizes



4202

EACH

- 4202 15-inch plate, 5-inch needle, weight 8.75 lbs.....  
 4203 15.5-inch plate, 6-inch needle, weight 10.5 lbs.....

**Needle Circle.** The needle circle of the Vernier Compass is movable by pinion in either direction, thus enabling the surveyor to set off the magnetic declination of the needle. The circle is graduated to half degrees on its upper surface, the whole degree marks being also cut down on the inside circumference, and is figured from 0 to 90 on each side of the line of zeros.

**Declination Arc and Vernier.** The declination arc is graduated to half degrees and reads to 45 degrees each way. The graduations of this arc are read by a vernier, 30 spaces of which correspond with 29 half degrees of the arc. Thus the vernier reads to single minutes and the number of minutes passed over is counted in the direction in which the vernier is moved. The compass face, needle circle, declination arc, and vernier are silvered. The declination arc is within the compass circle.

**Levels.** The spirit levels are placed at right angles with each other so as to level the plate in all directions, and are balanced upon a pivot under the middle of the tube, so as to be adjustable by a screwdriver.

**Needle Lifter.** Underneath the main plate is a needle lifting screw which, by moving a concealed spring, raises the needle from the pivot, and thus prevents the blunting of the point in transportation.

When the compass is not in use, it is the practice of many surveyors to let down the needle upon the point of the center pin, and allow it to assume its position in the magnetic meridian, so as to retain its polarity. We advise that after the needle has settled it be raised against the glass in order not to dull the point of the center pin.



## GEOLOGISTS' COMPASS

U. S. FOREST SERVICE STANDARD



4204

This instrument has proved admirably adapted for topographical work, and has been adopted by the U. S. Forest Service for the use of field men in making forest surveys and maps.

It is made of aluminum to secure lightness in weight and has a needle  $2\frac{5}{8}$  inches long enclosed with its compass circle in a circular box set on a plate 4 inches square. With the improved needle lifter as shown, a water and dust-proof needle box is assured.

The edges of this base are beveled and graduated, two for a tangent scale and two to inch scales. One of these latter is graduated to eights, each of which represents ten chains, and the other is decimal. The compass circle is made movable, and by a vernier attached to it on the inside the magnetic declination may be set off to 5 minutes.

On the under side of the plate is a township plat.

On the south side of the compass face is an arc of 180 degrees figured on each side of the 0 line from 0 to 90. A weighted pendulum hung from the center pin indicates, by its pointer on this arc, the angle of slope, when the compass is placed so that it rests on its south edge. On the outside of the box containing the compass circle is a movable circle, beveled and graduated on its upper edge and figured from 0 to 90, and having at each quadrant a slit for sighting.

Two tall folding sights are attached to the edge of the circular box, and two levels are placed at right angles with each other upon the base.

The compass is supported on a simple ball spindle and socket, with staff mountings, and is usually carried in a leather pouch with shoulder and belt straps. Such a pouch can be supplied at an additional cost.

The staff cap is slotted to allow vertical angles to be read by means of the pendulum while the compass is on the staff or tripod.

EACH

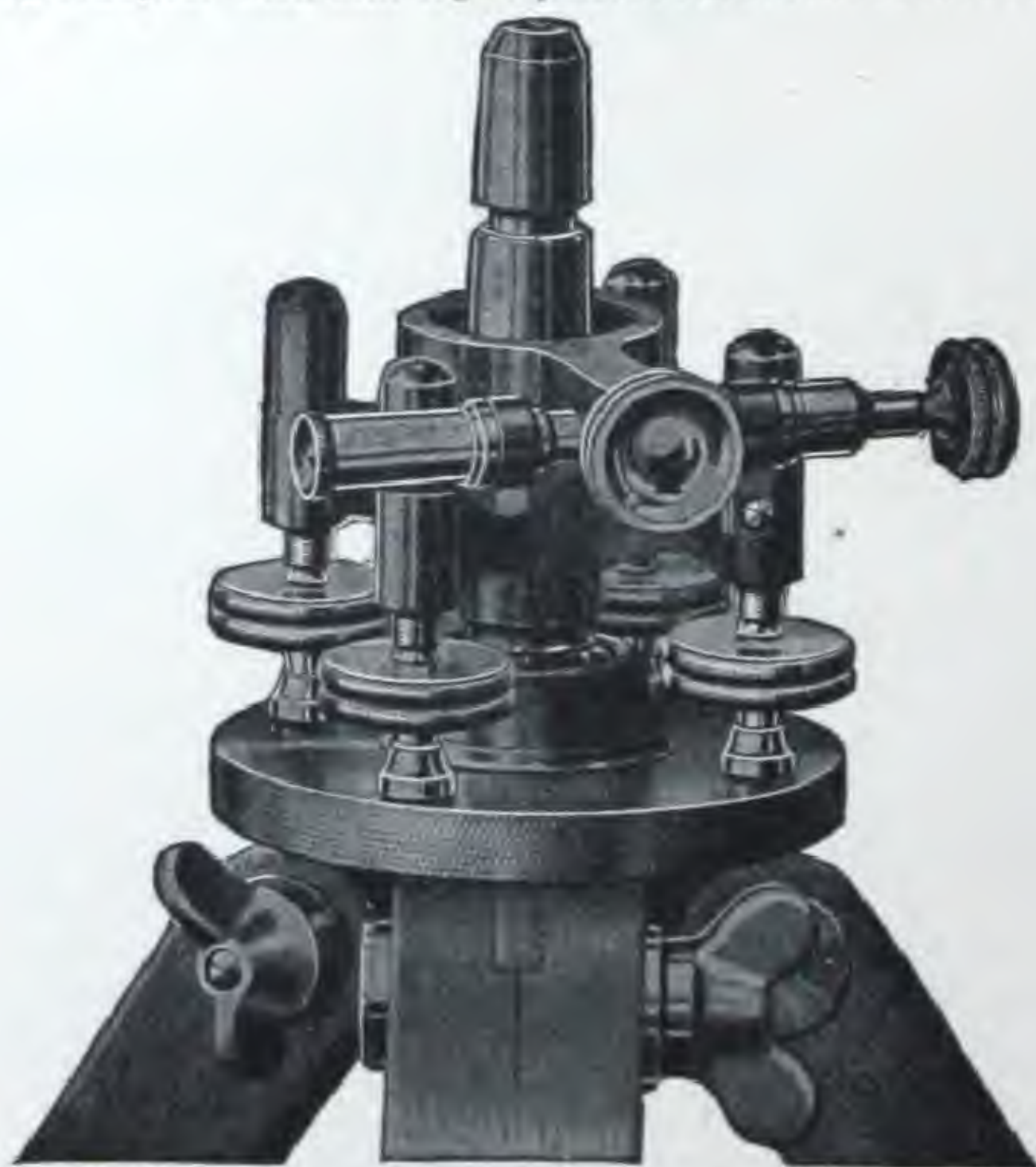
4204 Geologists' Compass (of aluminum), U. S. Forest Service pattern . . .



## ATTACHMENTS FOR COMPASSES



4205 Leveling Adopter with stiff leg tripod.....EACH



4205½ Leveling Head with stiff leg tripod.....EACH



## MINERS' COMPASS OR DIPPING NEEDLE



4207

In the hands of the prospector, the Miners' Compass or Dipping Needle proves a serviceable guide to the discovery and location of magnetic iron ore. In this instrument the magnetic needle is carefully balanced upon a horizontal axis within a graduated circle, and in which the needle will be found to assume a position inclined to the horizon. This angle of deviation is called the inclination or dip, and varies in different latitudes, and even at different times in the same place. Hence, in reading the dip for the suspected presence of magnetic iron ore, the observer must not only be governed by his instrument, but must also draw into requisition his knowledge of the general geological formation of the place of his survey; and dependent on his experience, he will be enabled to approximate as to the probable mass and depth of the ore from the surface. When used for tracing ore the observer should hold the ring in his hands and keep the needle north and south, standing with his face to the west. The inclination of the needle as read off on the graduated scale will show the dip. If the compass is held horizontal it serves of course as an ordinary compass.

EACH

- 4206 3-inch Dip Needle Mining Compass in velvet lined case. . . . .  
 4207 Same as No. 4206, but Norwegian pattern, needle gimballled. . . . .



## PEDOMETERS



4209



4210

EACH

4208 Pedometer, watch pattern, nickel case, registering distance walked up to 10 miles.....

4209 Pedometer, same as 4208, registering up to 100 miles.....

4210 Pedometer, high grade, watch pattern, nickel case, registering up to 100 miles.....

## MAP MEASURES



4211



4212

EACH

4211 Map Measure, watch pattern, dial with two graduations; 12 inches in eighths and 25 feet divided every foot.....

4212 Map Measure, watch pattern, with zero setting attachment, and 100 feet divided every foot.....

4213 Map Measure, universal, with handle. The index hand registers inches to miles, or centimeters to kilometers.....



## LOCKE HAND LEVELS



4216

EACH

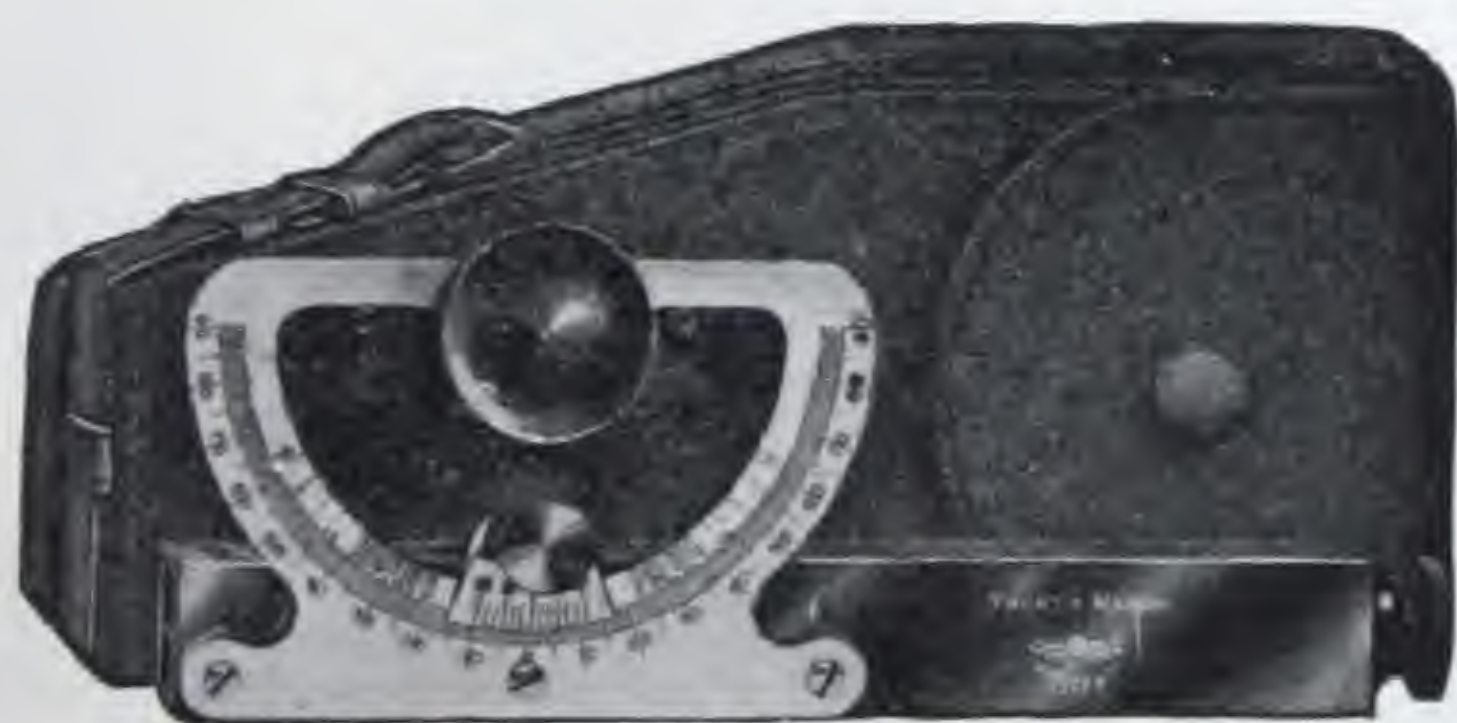
- 4215 Locke's Hand Level, German silver, in leather case, 5 inches.....  
 4216 Locke's Hand Level, bronze, in leather case, 5 inches.....  
 4217 Locke's Hand Level, brass, nickel-plated, in leather case, 5 inches



4218

EACH

- 4218 Hand Level, bronze, square, in leather case, 5 inches.....



4219

EACH

- 4219 Abney's Reflecting Level or Pocket Altimeter, 5 inches, large, German silver arc, with extra long draw telescope and improved fixing clamp to vernier, complete in leather case.....  
 See next page for instructions for use of the Abney Level.



## ABNEY'S LEVELS



4220

EACH

- 4220** Abney's Level, improved form as above, with circular base on which the whole rotates, by means of which horizontal angles can be measured. Complete in leather sling case.....

The Abney Level is used for ascertaining the height of buildings, trees or any other object; also for setting out gradients for railway, drainage and mining purposes, and any operation where angular distance or inclination of surface is required.

When the height of any object is required to be taken, a distance should be correctly measured from the object, say 100 feet, this forms the base line, and at which point the observer would stand, then direct his vision through the tube of the level, and elevate it until the highest point of the object is seen bisected by the horizontal edge of the reflector within the tube. While holding it steadily in this position, the spirit level, which is attached to the axis of the arc, should be turned upon its center until the bubble is seen reflected in the mirror, and also bisected by the horizontal edge of reflector. The alignment is then complete, and the height of object obtained by reading of the index of the arc.

The arc has two graduated scales upon it, one giving the angular measurements by degrees, and subdivided by the vernier divisions on the index. The other scale is figured 1 to 10 with their subdivisions, representing 1-10, 1-5, 1-3, etc., of the length of the measured base, and is read off by the fiducial edge at the side of index. If, therefore, the edge coincides with division 4, the height of object would be  $\frac{1}{4}$  of the base line, or 25 feet.



4221

EACH

- 4221** Stadia Hand Level Telescope 10 inches, with object glass 1 inch, adjustable eyepiece, stadia hairs reading 1:100, with ball joint and socket. Useful for preliminary surveys, etc.; weight about  $1\frac{1}{2}$  pounds, in leather sling case.....



## ANEROID BAROMETERS TRAVELING SETS

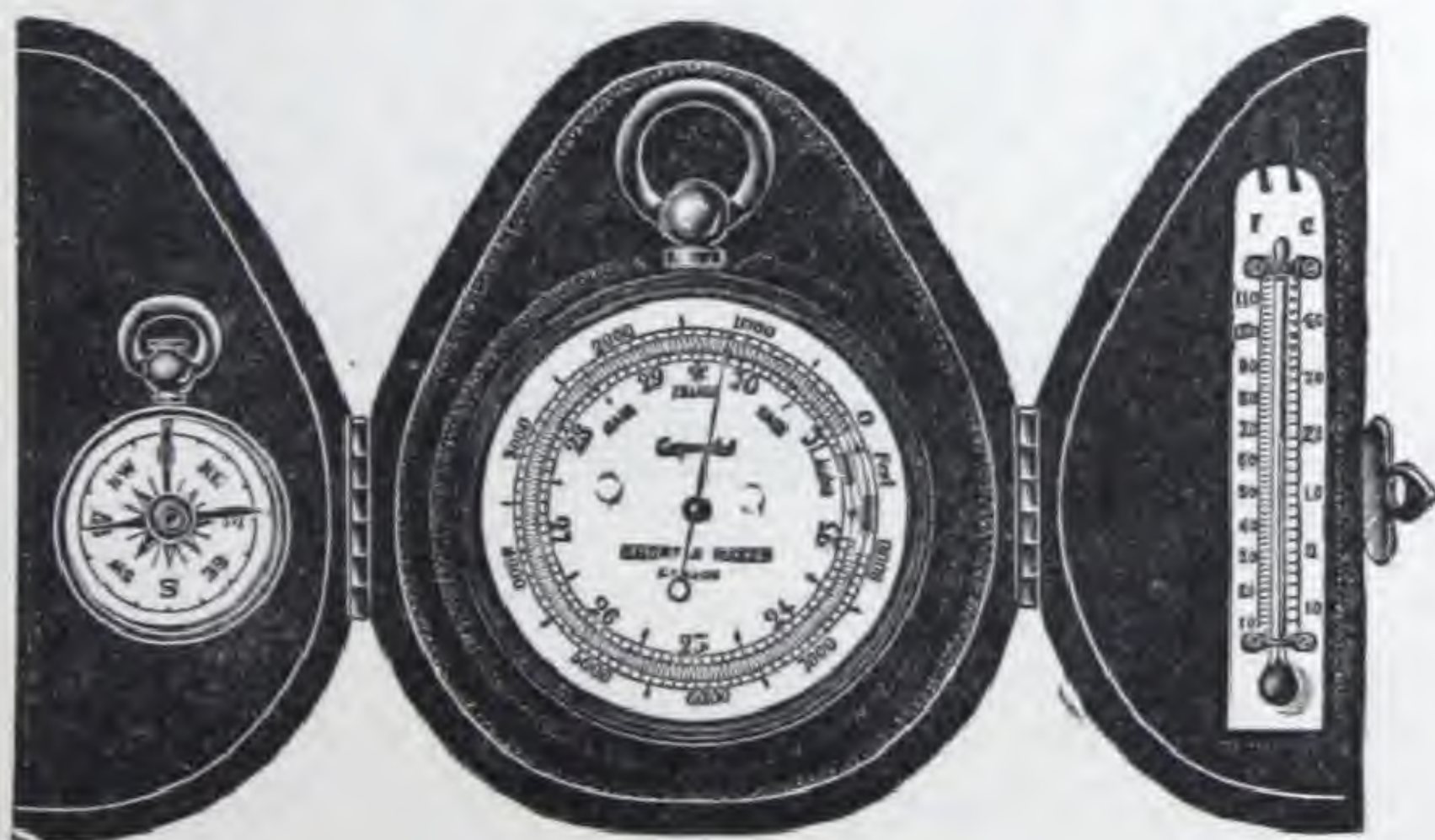
These movements are gold plated and lacquered, fitted with stops so that they can not register beyond the altitude engraved on the dial. This prevents any undue strain. Hairsprings and chains are noncorrosive and nonmagnetic.



4222

EACH

- 4222 Double opening case comprising 1 $\frac{3}{4}$ -inch best quality compensated watch size Aneroid, altitude 8000 feet in 50 feet divisions, with small floating dial compass, and thermometer on ivory in lid of morocco case.....



4223

EACH

- 4223 "Stanley" set, comprising 1 $\frac{3}{4}$ -inch best quality watch size Aneroid, altitude 8000 feet in 50 feet divisions, compensated for temperature, small size compass and thermometer, in folding best morocco case, to stand.....



## ANEROID BAROMETERS—Continued.

These movements are gold plated and lacquered, fitted with stops so that they can not register beyond the altitude engraved on the dial. This prevents any undue strain. Hairsprings and chains are noncorrosive.



4225

EACH

- 4225 Pocket size Aneroid,  $2\frac{1}{2}$  inches diameter, gilt cases, silvered metal dial, with altitude scale 8000 feet in 50 feet divisions compensated for temperature, morocco case.....
- 4226 Same as 4225, but altitude scale 3000 feet in 10 feet divisions..
- 4227 Same as 4225, but altitude scale 12000 feet in 50 feet divisions..
- 4228 Same as 4225, but altitude scale 16000 feet in 100 feet divisions..



## MILITARY, ENGINEERING AND SURVEYING ANEROIDS

Compensated for Temperature



4235

One of the best field instruments for accurate and rapid approximate surveys in ascertaining variations in gradients and levels in road making, railways, canals, watercourses and in mining.

EACH

- 235 Metal case, 2  $\frac{3}{4}$ -inch diameter, altitude scale 5000 feet, compensated for temperature, in leather sling case, 20 feet divisions.....



## SURVEYING ANEROID BAROMETERS

Reading to Single Feet of Altitude Scale. Compensated for Temperature



4238B

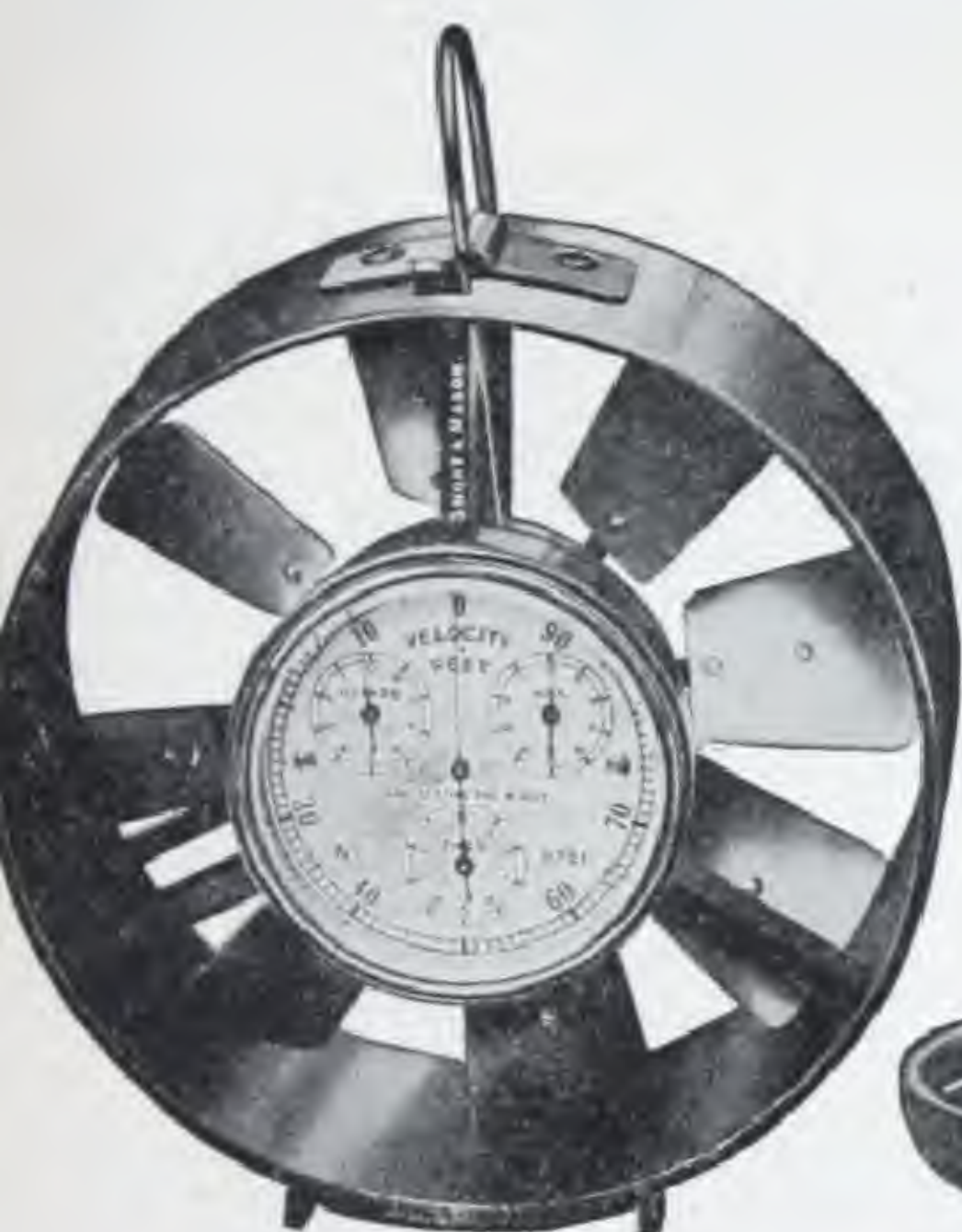
EACH

- 4238** 3-inch stout bronzed metal case, silvered metal dial, with vernier scale moved by rackwork motion, reading lens arranged to traverse the entire circle, altitude scale 6000 feet, in solid leather sling case.....
- 4238A** Same as No. 4238, but altitude scale 3000 feet.....
- 4238B** Same as No. 4238, but altitude scale 10000 feet.....
- 4238C** Same as No. 4238, but altitude scale 16000 feet.....
- 4239** 5-inch stout bronzed metal case, silvered metal dial, with vernier scale moved by rackwork motion, reading lens arranged to traverse the entire circle, altitude scale 6000 feet, in solid leather sling case.....
- 4239A** Same as 4239, but altitude scale 3000 feet.....
- 4239B** Same as No. 4239, but altitude scale 12000 feet.....
- 4239C** Same as No. 4239, but altitude scale 16000 feet.....
- 4240** 5-inch stout bronzed metal case, silvered metal dial, with vernier scale moved by rackwork motion, reading lens arranged to traverse the entire circle, altitude scale arranged for mining purposes, 4000 feet ascent, 2000 feet descent, in leather sling case.....

4238A, 4239 and 4239A read to single feet of elevation.



## ANEMOMETERS



4251



4254

EACH

4250 Biram's Anemometer, 3 inches, 2 dials, reading to 1,000 feet....

4251 Biram's Anemometer, 4 inches, 4 dials reading to 100,000 feet....

4252 Biram's Anemometer, 6 inches, 4 dials reading to 100,000 feet....

Anemometers Nos. 4250, 4251 and 4252 are all jewelled movements, fitted with patent zero setting attachments and are enclosed in leather carrying cases. No. 4251 is the most satisfactory of all patterns.

4 INCH 6 INCH

4253 Heavy Hand Sewed Leather Sling Cases for above.....

4254 Biram's Anemometer, pocket size, 2 dials reading to 1,000 feet.....

Each instrument is tested and a chart of corrections supplied



## GURLEY PLANE TABLES

The plane table method of topographic map making is rapidly increasing in popularity among topographers, geographers, landscape engineers, geologists and others who require accurate maps that can be made easier and quicker than by the usual method of transit survey.

On account of their combined efficiency and portability, the several Gurley Instruments designed especially for this class of work have become standard equipment with the principal users.

The Plane Table is an instrument by means of which points are located in the field by graphic methods on a map, which is fastened to a drawing board supported on a tripod. The most important advantages of the plane table method over other topographic methods, is that all sketching is done in the field, where the topographer can see the form of the ground that he is mapping. He can sketch details at once in their proper position without burdening his memory and without making elaborate notes.

For landscape work, points on a designed map can be transferred to the field. For contour or topographic surveying, the direction of sights can be marked, while the distances, both vertical and horizontal, can be taken by the stadia, and plotted without further notes. For traverse work a smaller board is used with an alidade having slotted sight vanes instead of a telescope.

**Johnson Movement:** The drawing board is mounted on the tripod by the improved Johnson Movement with ball-and-socket head. Loosening the upper wing nut allows the board to be leveled in any direction by the pressure of the hand and clamped firmly. By loosening the lower wing nut, the board can be oriented about its vertical axis and clamped.

**Alidade:** The alidade consists of a flat blade on which is supported a telescope with a vertical motion only, and a vertical arc to measure this motion. It can be moved about on the surface of the board as desired. The alidade blade may be beveled on the edge and graduated for a scale. A pencil drawn along the fiducial edge of the blade registers the line. If the points sought are thus lined off and the table set up in another position and oriented parallel to its first position, similar lines drawn in the new position will give intersections that define the location and relation of the points.

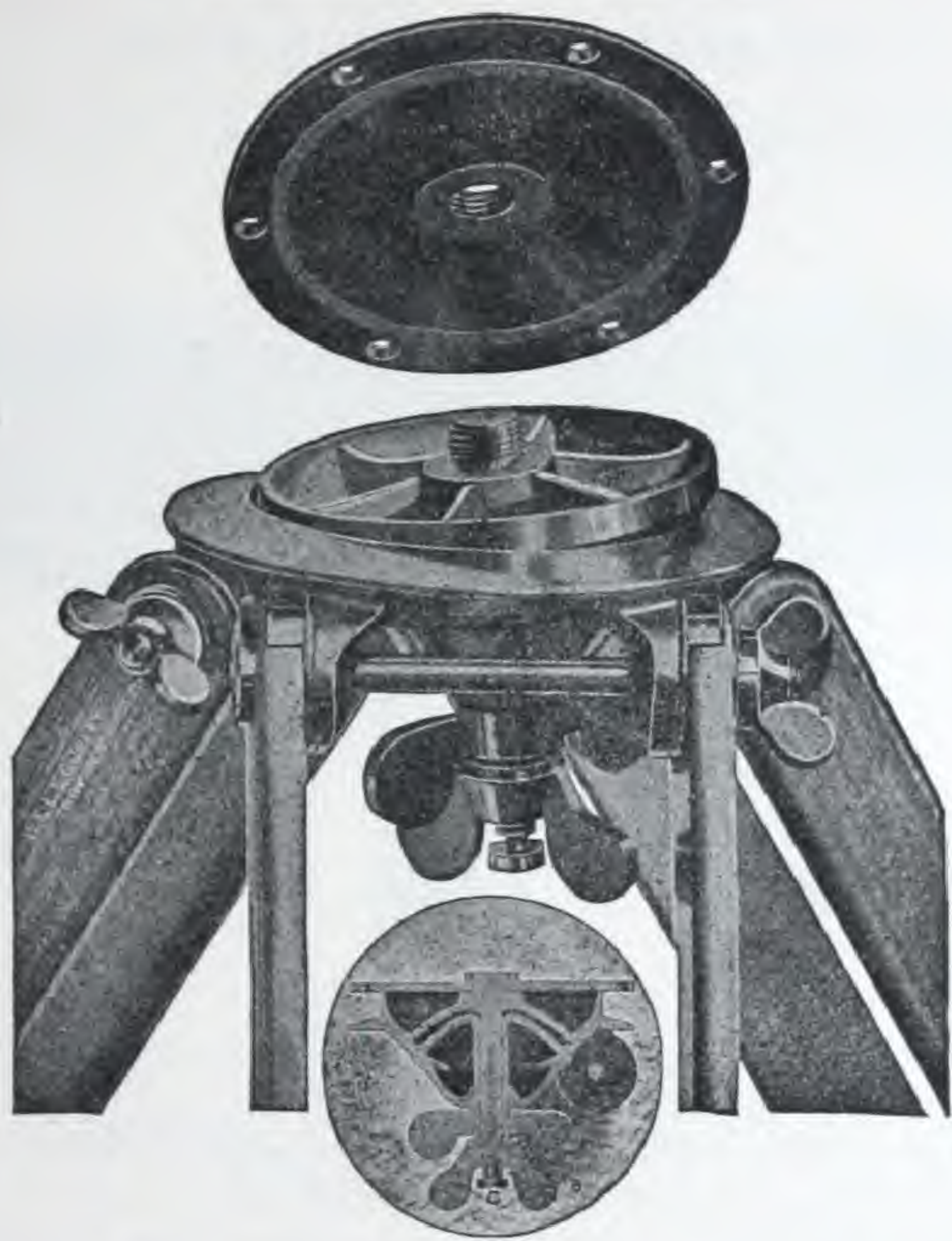
**Drawing Board:** The wooden table is built up to prevent warping. For use in some localities, as the Philippine Islands, cleats are screwed to the underside. The screws pass through the cleats in oblong slots with metal bushings which fit closely under the heads but allow the screws to move freely when drawn by the contraction or expansion of the board, caused by climatic conditions. The paper is held firmly by brass screws passing through the edges of the paper into brass sockets let into and slightly below the surface of the board. This method offers no obstruction to the movement of the alidade about the surface of the board.

**Compass:** A square brass plate with a compass and spirit levels serve to level the board and if placed against the edge of the alidade blade, will give magnetic bearing. Another form has a trough compass either inserted in the edge of the board or mounted on the alidade blade, and a circular level on the blade.

**Plumbing Arm:** The plumbing arm, as shown in the figure, has an index at its end that may be brought to a given place on the paper, the plummet hanging below indicating the corresponding point on the ground.



GURLEY PLANE TABLES



570G

Johnson Plane Table Movement and Split Leg Tripod

The improved form of Johnson Plane Table Movement, as shown above, combines in a most satisfactory manner stability, light weight, and ease of operation. This extremely efficient and portable plane table has been adopted as standard equipment by the U. S. Geological Survey and many of the State Geological departments.

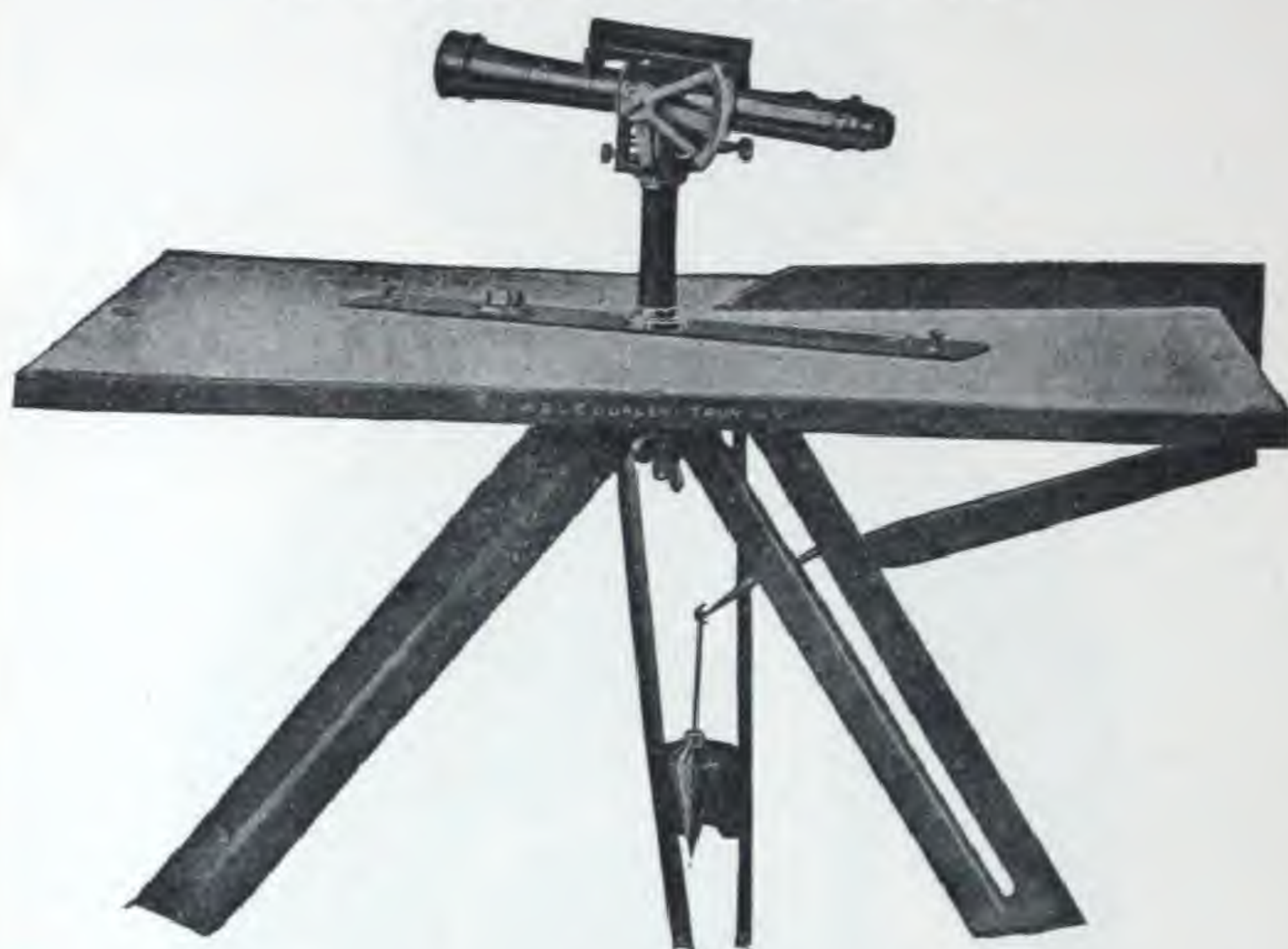
JOHNSON PLANE TABLE MOVEMENTS AND EXTRAS

		EACH
570G	Johnson Plane Table Movement and split leg tripod.....	
571G	Johnson Plane Table Movement, special light weight model, with special light weight extension leg tripod.....	
	Canvas Case, leather trimmed, for No. 571G .....	
573G	Drawing Board, 31 x 24 in., with brass screw plate fitted, and with eight clamp screws and sockets for paper.....	
573AG	Canvas-covered Wooden Case for No. 573G .....	
573BG	Flexible Canvas Case with shoulder strap, for No. 573G .....	
573CG	Eggshell Drawing Paper, single mounted, 31 x 24 in., per sheet.....	
573DG	Eggshell Drawing Paper, double mounted (muslin between), so that drawings can be made on both sides, 31 x 24 in., per sheet.....	
573EG	Drawing Board, 15 x 15 in., with brass screw plate fitted and four clamp screws and sockets for paper.....	
573FG	Flexible Canvas Case with shoulder strap, for No. 573BG .....	
573HG	Eggshell Drawing Paper, single mounted, 15 x 15 in., per sheet.....	
573JG	Eggshell Drawing Paper, double mounted (muslin between), so that drawings can be made on both sides, 15 x 15 in., per sheet .....	



## GURLEY PLANE TABLE OUTFITS

U. S. GEOLOGICAL SURVEY STANDARD



576JG

**Plane Table Outfit, with Johnson Movement, and No. 584-CG Alidade, with Beman Stadia Arc**

EACH

**576CG** Plane Table Outfit, consisting of Johnson Movement No. 570G, with split leg tripod; Drawing Board No. 573G, 31 x 24 inches, with brass screw plate fitted, and with eight clamp screws and sockets for paper.....

**576DG** Flexible Canvas Case with shoulder strap, for No. 573G Drawing Board.....

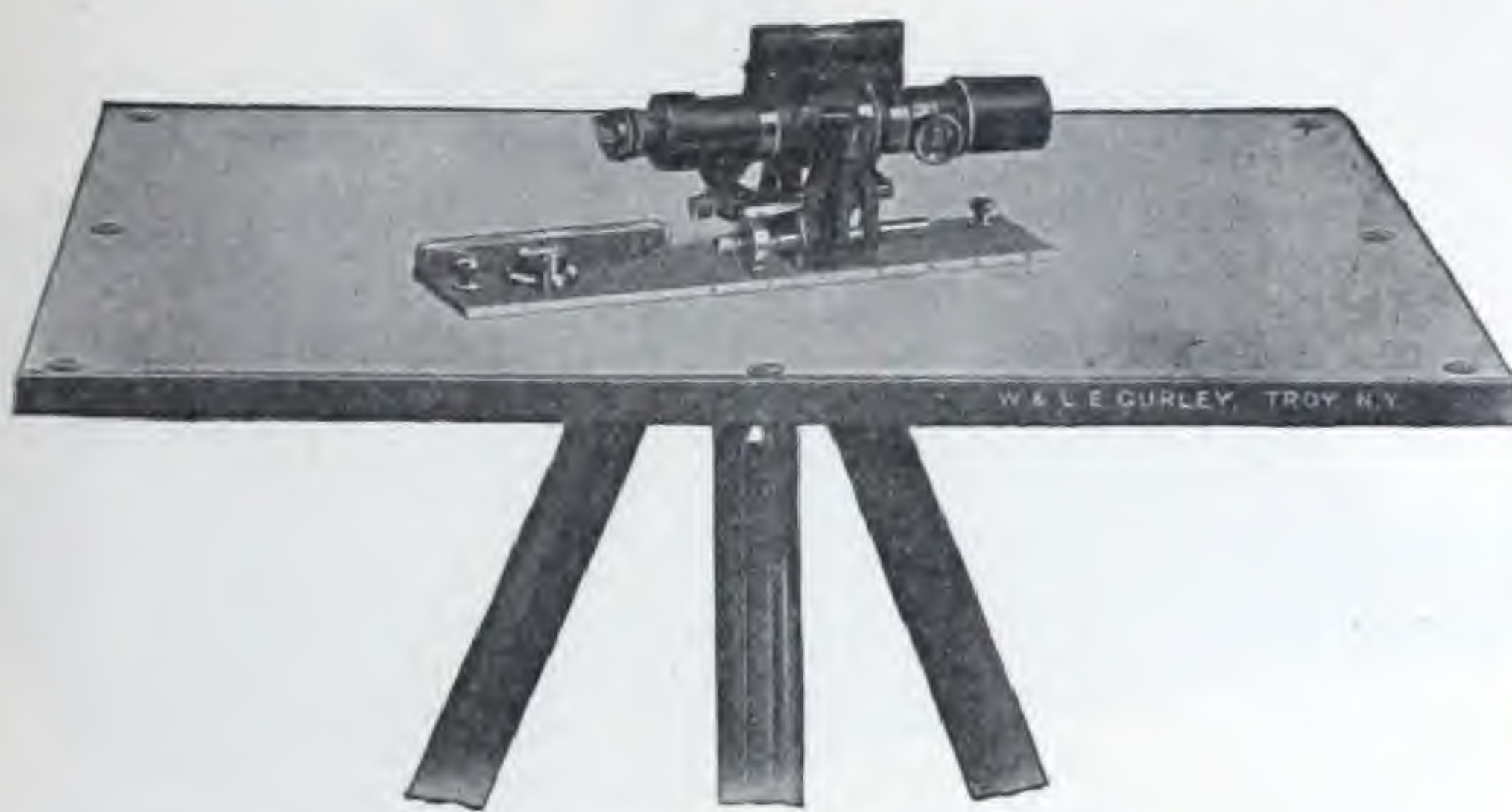
**576EG** Plumbing Arm and Plumbet.....

**576FG** Alidade No. 584CG, with 11 inch telescope, inverting eyepiece with diagonal prism, power about 22 diameters, enlarged objective, 1.38 inch aperture, platinum cross wires and stadia wires; detachable striding level with revolving shield; edge graduated vertical arc reading to 1 minute, combined with Beman Stadia Arc; clamp and tangent to telescope axis; blade 18 x 3 inches; with left hand edge beveled; circular level, and box compass with 4 inch needle, mounted on blade. In mahogany carrying case.....

**576JG** Complete as illustrated and described above.....



## GURLEY EXPLORERS PLANE TABLE OUTFITS



592FG

EACH

- 592H** Explorers Plane Table Outfit, consisting of Johnson Movement No. 571G, special light weight model, with special light weight extension leg tripod; Drawing Board No. 573BG, 15 x 15 inches, with brass screw plate fitted, and four clamp screws and sockets for paper.

Flexible Canvas Case with shoulder strap, for No. 573BG Drawing Board.

Explorers Alidade No. 592CG, with Gradiometer and Beaman Stadia Arc.....

- 592FG** Complete, as illustrated and described above.....

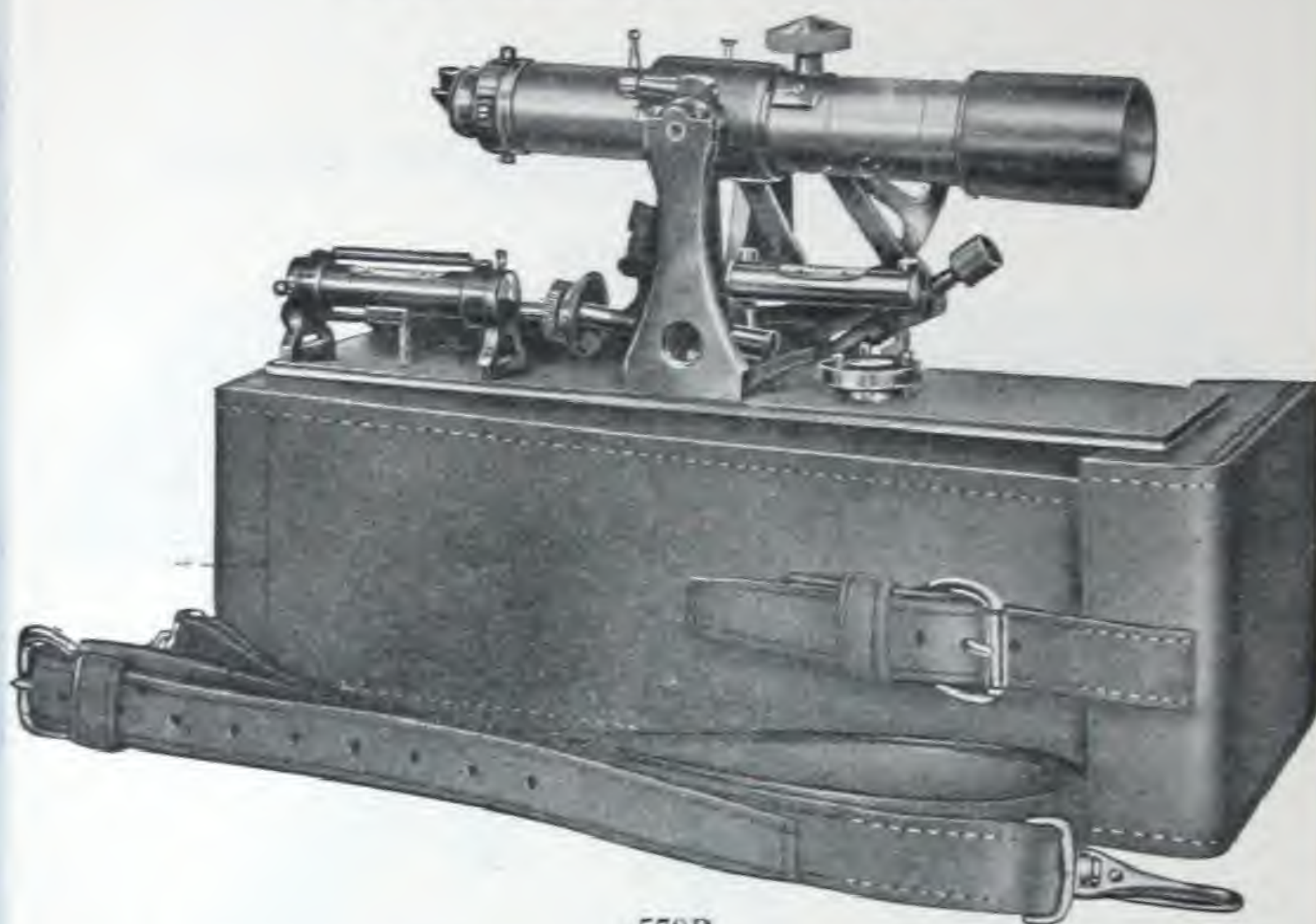
18 x 24 in. 15 x 15 in.

- 573HG** Eggshell Drawing Paper, single mounted, per sheet.....

- 573JG** Eggshell Drawing Paper, double mounted (muslin between), so that drawings can be made on both sides, per sheet.....



## BUFF EXPLORERS' ALIDADE



578B

EACH

**578B** With revolving prismatic eye-piece, fixed stadia wires, 3 x 12 inch base,  $\frac{1}{8}$  celluloid bottom, large telescope with extra large field, telescope to revolve, extra large screw heads for operating clamp screws, circular bubble, right hand side of base beveled, bright polished and finished telescope, vertical arc reading to single minutes; all complete with leather case and straps.....

## EXTRAS

**578 $\frac{1}{2}$ B** Mahogany Carrying Case with leather carrying straps in place of leather case.

**578AB**  $\frac{3}{4}$ -inch Striding Level, adjusting screws at both ends and easily adjustable.....

**578CB** 4-inch Box Compass with extra light weight and accurate needle.

**578DB** Johnson Plane Table movement complete and three-leg regular tripod.....

**578EB** Drawing Board, 15 x 15 with 4 improved flush fittings.....

**578FB** 1 No. 3 Gradiometer Attachment.....

**578GB** 1 Control Bubble attached to Vertical Vernier.....

**578HB** Clamp and Slow Motion Screw to move Vernier and to control the Vernier and Bubble.....

## Characteristics

1. Extra powerful telescope.
2. Increase of 180% in size of image and field of view, due to a re-designed prismatic eye-piece.
3. Compact and strong design and no delicate parts exposed.
4. Vertical arc and clamp and tangent motions are placed inside of the standards, thus giving extra protection against any possible injury.
5. The instrument is equipped in every detail to guard against any projections, and all adjustment screws kept low and countersunk.



## ENGINEERS' BUSH KNIVES, BUSH HOOKS AND AXES



4271

Engineers' Bush Knives for cutting down shrubs, small trees, brush, pointing stakes, etc.

EACH

- 4271 Engineers' Bush Knives, 22-inch blade.....  
4272 Engineers' Bush Knives, 17-inch blade.....



4273

- 4273 Engineers' Bush Hooks, fitted with a long ax handle for cutting down branches of trees, shrubbery, brush, etc.....



4274

Engineers' Axes with broad heads for sharpening and drivings takes, cutting down trees, etc.

- 4274 Engineers' 5 -pound Axes, with long handles.....  
4274A Engineers' 3½-pound Axes, with long handles.....



## ELLIOTT ENGINEERS' TRANSIT



11008

See next page for description and extras  
Transits and Levels repaired on short notice at lowest prices



## ELLIOTT ENGINEERS' TRANSIT—Continued.

**11008** Elliott Engineers' Transit, suitable for city, county, mining and bridge engineers. The telescope is  $11\frac{1}{2}$  inches long, having a clear aperture of  $1\frac{1}{4}$  inches, power of the telescope 24 diameters. The eye piece is operated by a screw movement to focus the cross hairs. The cross hairs are placed with four improved capstan head screws for adjustment. The object slide is moved by rack and pinion and is guaranteed to be correct for all distances. The telescope axle is made of very hard bell metal and reverses in strong cloth covered bronze cast standards which have improved bearings, with adjusting screw on one side to bring the telescope plumb. On the left side of the telescope axle is a spring tangent connected with the standard for use in setting the telescope level by slow motion. On the right side of the telescope axle is fastened a fixed strong arc graduated on solid silver 90 degrees each way, the double verniers to the arc being fastened to the standard and is graduated on solid silver, reading to single minutes.

The arc is so adjusted when graduations are set on zero, the sensitive bubble and telescope will be level and the instrument can be used for leveling. The compass is cast solid on the plate and graduated to half degrees in quadrants from zero to 90 degrees. The needle is  $4\frac{1}{2}$  inches long, hand made from the best steel and tempered. A fine wire is attached to south end of needle for balancing. An improved lifter is attached to one side of the compass to lift the needle when not in use. The upper plate, on which the compass is cast solid to strengthen the plate, is of the best red brass casting. It has two double verniers of solid silver, graduated to minutes. The Verniers are marked A and B and covered with polished glasses which are cemented in the plate, the seam being covered with a neat frame which keeps it from breaking and makes it watertight.

The spirit levels are placed square with the leveling screws for quick leveling. The horizontal limb is of red brass casting with inlaid solid silver, being  $6\frac{1}{4}$  inches diameter between edges of graduations. It is graduated from zero to 360 degrees, with two sets of figures running in opposite directions. The flange on which the limb is fitted has four small screws for correct centering of the limb. The limb is clamped by a screw, and a tangent screw is fitted on the upper plate for setting the vernier correctly. The center on which the upper plate is fitted is made long, of hard bell metal, and fits in a bronze socket with a heavy flange where the limb is fitted. The bronze socket is fitted in a cast red brass lower socket or level head. The lower tangent is fitted on a special ring which prevents clamping the tangent direct to the lower socket. The lower clamp and tangent movement serves to turn the whole instrument upon its sockets, so as to fix the telescope upon any given point, or when unclamped allows it to be directed approximately by hand.

The four leveling screws are of bronze and are accurately fitted in the cast red brass level head. The level screws rest in cups in which they turn without marring the surface of the lower plate. The lower plate on which leveling screws rest has a large opening in the center in which a smaller plate shifts, fastened with a ball to the leveling head. By this device when the leveling screws are loosened the instrument can be easily shifted and the plummet which hangs from the center may be set over a point without moving the tripod. The tripod has split legs (extension legs can be furnished, if desired). Instrument is furnished in mahogany case. Weight of instrument,  $16\frac{1}{2}$  pounds, tripod, 11 pounds.

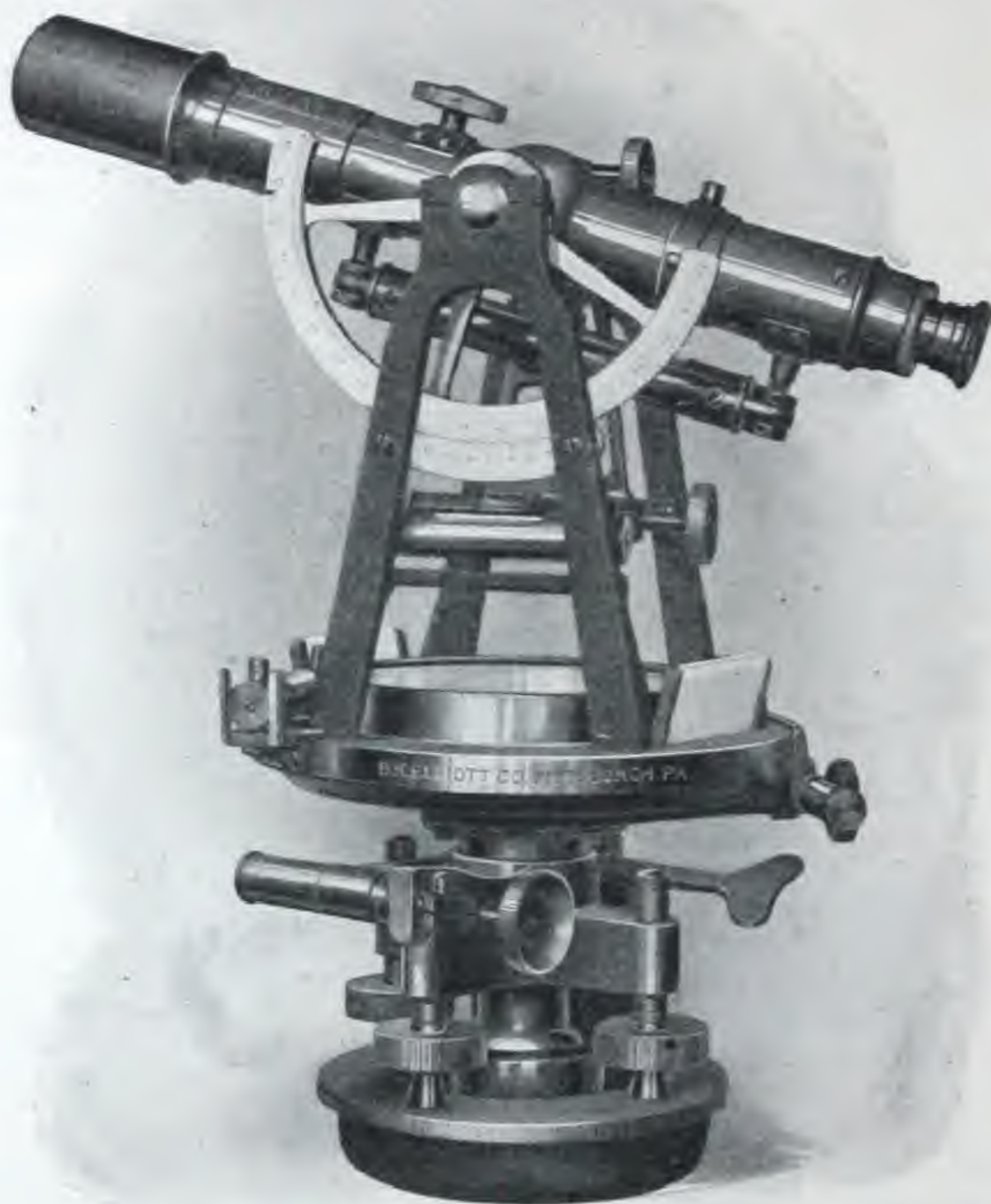
## EXTRAS FOR No. 11008 TRANSIT

- 11008A** Standards finished like instrument.....
- 11008B** Graduation of horizontal circle reading to 30 seconds.....
- 11008C** Graduation of horizontal circle reading to 20 seconds.....
- 11008D** Adjustable tripod instead of split leg tripod.....
- 11008E** Stadia wires, fixed.....
- 11008F** Variation plate.....

**Transits and Levels repaired on short notice at lowest prices**



## ELLIOTT MOUNTAIN OR MINING TRANSIT



11009

- 11009** Elliott Mountain or Mining Transit, similar to No. 11008, has 9½-inch telescope, power 18 diameters, horizontal limb 5 inches diameter between edges of graduations, graduations on solid silver, with two double verniers reading to single minutes, vertical arc 5 inches diameter, compass needle 3½ inches long, standards cloth finished, extension tripod, mahogany case. Instrument weighs 13 pounds; tripod weighs 12 pounds.

Each.....

Transits and Levels repaired on short notice at lowest prices



## RECONNAISSANCE TRANSIT



11011

**11011** Reconnaissance Transit has 9-inch telescope, power 16 diameters, level on telescope, horizontal limb 5 inches diameter, has one double vernier graduations reading to single minutes,  $3\frac{1}{2}$ -inch vertical circle with one double vernier reading to five minutes, compass needle  $3\frac{1}{2}$  inches long, adjustable tripod, neat wooden case. Weight of instrument with tripod 15 pounds.

Each.....

**Transits and Levels repaired on short notice at lowest prices**



## BUILDERS' TRANSIT



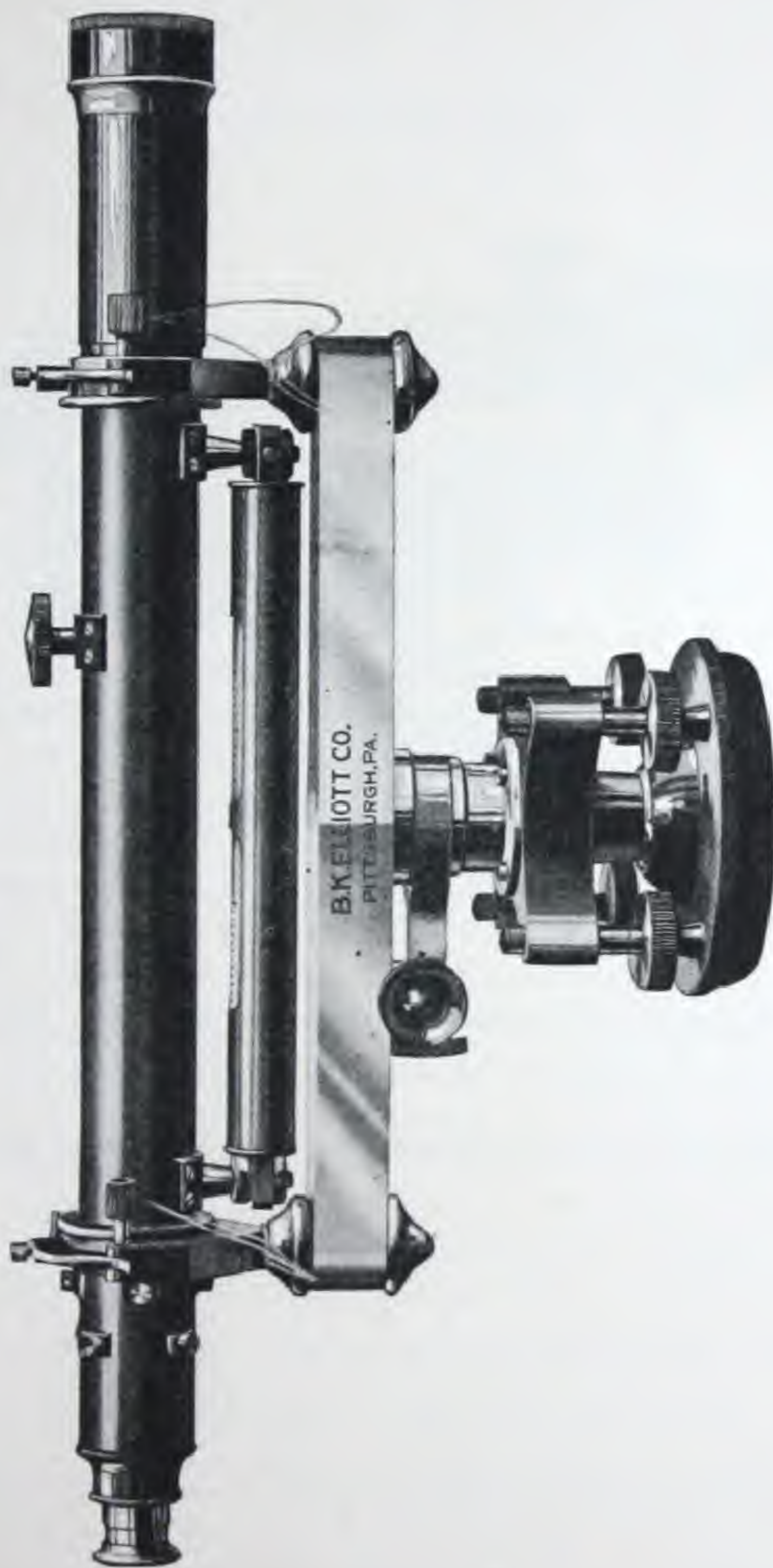
11012

**11012** Builders' Transit has 9-inch telescope, power 15 diameters, horizontal limb 5 inches diameter between edges of graduations, has one double vernier, graduations reading to single minutes, tripod has solid legs, neat wooden case. Weight of instrument with tripod 13 pounds. Each .....

**Transits and Levels repaired on short notice at lowest prices**



ELLIOTT ENGINEERS' WYE LEVEL



11010

See next page for description and price

Transits and Levels repaired on short notice at lowest prices

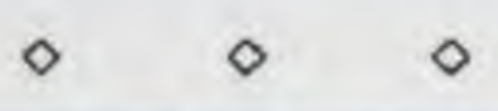


### ELLIOTT ENGINEERS' WYE LEVEL

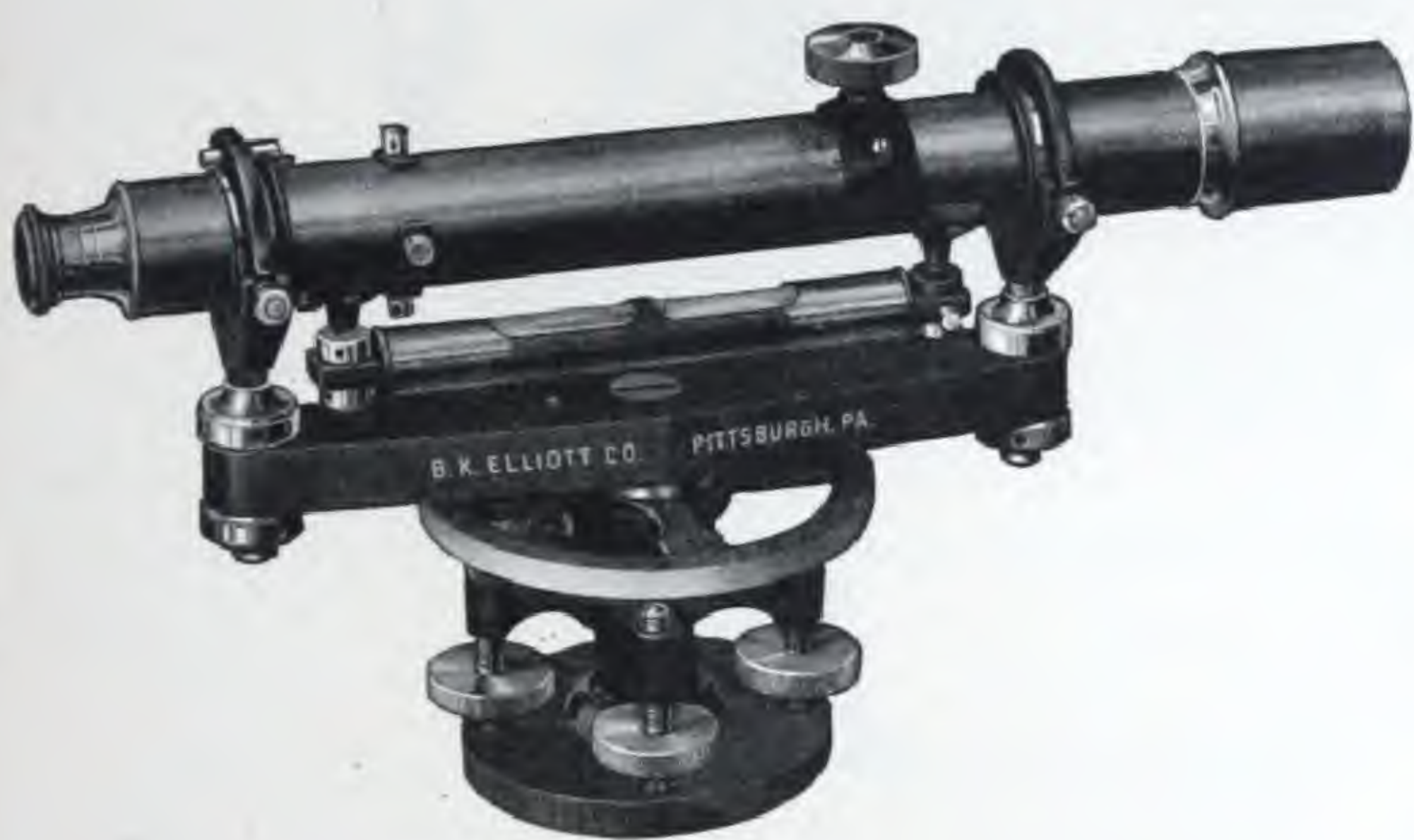
- 11010** Elliott Wye Level, made specially strong, having a powerful telescope about 18 inches long, aperture of object glass  $1\frac{3}{4}$  inches in diameter, magnifying power 34 diameters, eyepiece provided with screw movement for the accurate focusing of cross wires, the telescope collars which rest in the wyes are made of the hardest bell metal, and a stop is arranged to set cross hairs true on all distances, the objective slide is moved by rack and pinion, provided with a dust guard, and true on all distances, spirit level is 8 inches long and sensitive. The bar is 12 inches long, cast hollow and provided with ribs, the wyes are strong and adjustable. The center is long and of the hardest bell metal, which may be clamped, and slow motion given to the telescope. The leveling head is strong, with four leveling screws for quick leveling, tripod furnished split legs, instrument packed in mahogany case. Each. .
- 11011 $\frac{1}{2}$**  Same, with adjustable tripod, instead of split legs. Each. . . . .

**Transits and Levels repaired on short notice at lowest prices**





BUILDERS' LEVEL



11013

- 11013 Builders' Level, telescope 12 inches long, power 24 diameters, spirit level 6 inches long, instrument turns on horizontal circle 4½ inches diameter, graduated zero to 90 degrees each way, and is read to five minutes by a vernier fixed to the spindle, telescope, bar and level head made of best materials and good workmanship, has metal trivet, tripod with solid legs, and strong wooden case. Each.....
- 11014 Same as above, with tangent screw. Each.....
- 11014½ Same as 11013, but with compass, having 3½ inch needle. Each...

Weight of instrument and tripod, 13½ pounds.

Transits and Levels repaired on short notice at lowest prices



## COMBINED LEVEL AND TRANSIT



11015

EACH

- 11015** Convertible Level is a combined level and transit. Telescope is 12 inches long, magnifying power 25 diameters, showing objects erect, object glass  $1\frac{1}{4}$  in. aperture; rack and pinion movement to object slide, spiral movement to eyepiece. Range 5 ft. to mile, lenses of best quality, level on telescope 4 in. long, cross bar and standards are cast integral, heavily ribbed and strengthened. Wyes are of improved design, convertible standards provided with two brass straps which hold telescope firmly in the trunnions when in transit position. Horizontal circle of  $4\frac{1}{2}$  in. diameter, numbered 0 to 90 in quadrants, vernier reading to 5 mins. Improved leveling head, solid leg tripod, polished hardwood carrying case, 6 oz. plumb bob, trivet, sunshade and adjusting pins. Weight of level 8 lbs., with case and accessories 15 lbs. Weight of tripod 6 lbs. Price, each.....\$
- 11016** Convertible Level, same as No. 11015, with addition of Philadelphia Arc divided to degrees numbered 0 to 40 each way and reading by vernier to 3 minutes. Price, each.....\$



## THE "BUFF PRECISE TRANSIT"

The Buff Transit is not the product of today nor of a few years, but the crowning result of over forty years' experience in dealing with a very critical clientele. The instrument shows it.

Buff Transits meet with minimum atmospheric resistance, for the construction is such as to cut the air—not to obstruct it and collect dust as the standards and forms of most instruments do. Our instruments are as nearly as possible dust proof.

Buff instruments will withstand a greater degree of heat and moisture without impairment of their accuracy than others, owing to their superior metal, precise method of assembling, and final finish.

The density of the metals, combined with the superior grade of workmanship in the construction, enables Buff instruments to withstand most severe shocks without disturbing the adjustments.

Suffice it to say, therefore: "The best instrument procurable is the cheapest in the end."

### ITS ECONOMY

In point of economy the "Buff" Precise Transit is considered by the manufacturers unequalled by any other transit made.

They know that it will always accomodate itself to adverse circumstances and offer up clear work at all times with its more powerful telescope.

They know that it will preserve its adjustments unimpaired for a long time owing to the rare skill with which its centers are constructed of the toughest metals.

### Specifications of four regular sizes of the "Buff" Transits

	Size No. 1	Size No. 2	Size No. 3	Size No. 4
Weight .....	13½ lbs.	10 lbs.	7 lbs.	5 lbs.
Dia. of Grad. ....	6¼ in.	5⅛ in.	4½ in.	4 in.
Length of Needle .....	4½ in.	3¾ in.	3¼ in.	2½ in.
Power Erect. Telescope .....	26.5 dia.	22.5 dia.	18 dia.	17 dia.
Power Invert. Telescope .....	29 dia.	25 dia.	21 dia.	20 dia.
Length of Telescope .....	12 in.	10¾ in.	8 in.	8 in.
Length Level Bubble .....	6 in.	5½ in.	4 in.	4 in.
Dia. Telescope Aperture .....	1¼ in.	1¼ in.	1⅛ in.	1⅛ in.

Transits and Levels repaired on short notice at lowest prices



## CROSS HAIRS AND STADIA THAT CAN BE FURNISHED WITH BUFF TRANSITS

Diameter of web as ordinarily used by other makers, .0002-.0003.

Diameter of minimum web for telescopes of our make, .0001 inch and less for finer astronomical instruments.

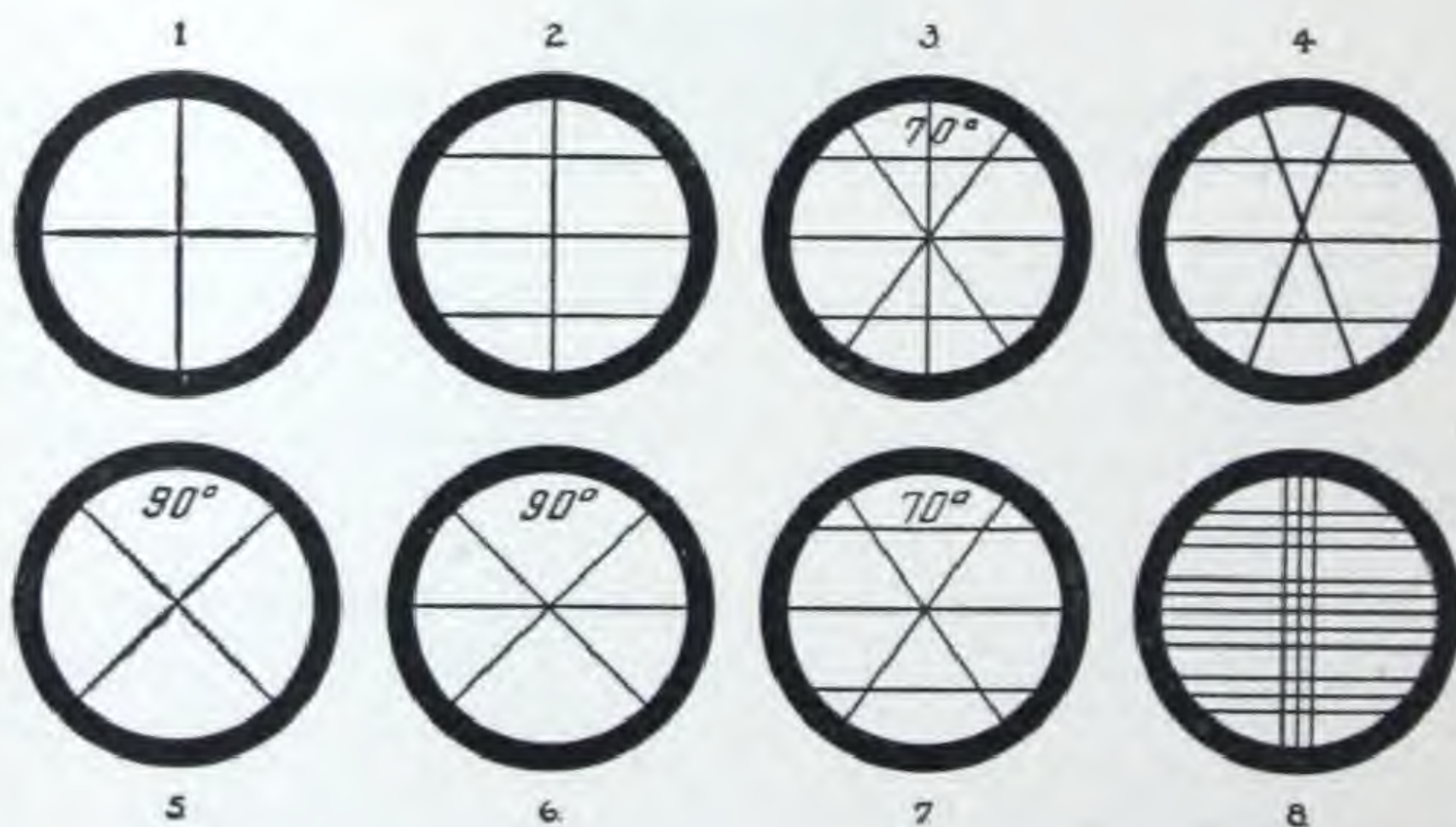
The cost of inserting the stadia in any of our new telescopes is done at a reasonable price.

For the adjustable stadia wire the charge is done at a nominal cost. This form we do not recommend since it is liable to derangement.

The constant, which is to be added to all stadia measurements can be accurately assumed as 1.5 times the focal length of the object-glass (with our system of lenses). Its individual value is supplied with every instrument.

Diagrams below show best arrangements for all cases of engineering and surveying practice.

Special arrangements can be supplied if specified.



Nos. 1, 5 or 6 are furnished as equipment

EACH

- |   |  |  |
|---|--|--|
| 2 | Stadia and Cross Wires.....                      |  |
| 3 | Stadia and Diagonal Wires 70°.....               |  |
| 4 | Stadia and Diagonal 1/8" above intersection..... |  |
| 7 | Triangulation.....                               |  |
| 8 | Stellar Observation.....                         |  |



## BUFF "PRECISE" TRANSIT—Continued.

## SPECIFICATIONS—No. 1A TRANSIT

Graduation,  $6\frac{1}{4}$ -inch diameter, with two opposite double reading verniers to minutes, placed at either  $30^\circ$  or  $90^\circ$  to line of sight. Two rows of opposite inclined figures  $0^\circ$ - $360^\circ$ . Graduations silvered and covered by pure crystal plate glass.

Telescope, erecting or inverting, is balanced and reverses at either end; 12 inches long,  $1\frac{1}{4}$ -inch aperture, with power of 26.5 dia. improved eye-piece, unsurpassed large clear field. Center point is provided on top of telescope to permit of accurate centering from above. Adjustment for vertical plane, and line of collimation correct for all distances.

Sensitive Lever Bubble, 6 inches long, with clamp and tangent to telescope.

Improved lower and upper Spring Tangent Clamps.

Shifting Center with  $\frac{3}{4}$ -inch adjustment.

Spirit Levels, truly ground by special machine, rated and sensitive.

Standards are cloth finished.

Long Taper centers with broad flanges and of hardest bell metal and phosphor bronze.

Compass Needle is  $4\frac{1}{2}$  inches long and of accepted form.

Compass graduation is silvered and figured with a single row 0-90 on each side of N. and S.

Tripod improved; split leg with wing nuts, weight  $7\frac{1}{2}$  pounds.

The mahogany instrument box is provided with strap, brass lock and hooks, and contains plumb-bob, pocket magnifier, sun-shade, wrench, screwdriver, adjusting pins, etc.

No. 1A Transit weighs  $13\frac{1}{2}$  pounds.

## EXTRAS TO No. 1 SIZE TRANSIT

- 1-31 Graduation, horizontal circle, solid silver.....
- 1-32 Graduation, horizontal circle, reading to 30 seconds.....
- 1-33 Graduation, horizontal circle, reading to 20 seconds.....
- 1-34 Graduation, horizontal circle, reading to 10 seconds.....
- 1-35 Graduation, vertical circle, solid silver.....
- 1-36 Graduation, vertical circle, reading by one vernier to 30 seconds...
- 1-37 Ground Glass Shades to Verniers.....
- 1-38 Standards, finished and polished bright (like telescope).....
- 1-39 Improved Gradiometer Attachment.....
- 1-40 Reversion Level, for leveling with telescope reversed (see page 326)
- 1-41 Fixed Stadia Wires, guaranteed 1 foot in 100 feet.....
- 1-42 Variation Plate and Ring.....
- 1-43 Short Focus Lens Attachment. No. 1 Lens, \$     ; No. 2 Lens, \$
- 1-44 Dust Caps to Leveling Screws.....
- 1-45 Silk Waterproof Bag to cover instrument.....
- 1-46 Superfine Watch Oil, per bottle.....
- 1-47 Extra Extension Tripod,  $9\frac{1}{2}$  pounds.....
- 1-48 Extra Regular Tripod,  $7\frac{1}{2}$  pounds.....
- 1-49 Reflector Shade for Cross Wires.....

The transit, as illustrated, represents the highest perfection of the instrument makers' art. Accuracy, quality, finish and equitable price have obtained for it exclusive use on the largest works in progress at the present time.

The sensitiveness of the spirit level attachment is equivalent to that of many wye levels, and allows of high accuracy in leveling up to 200 feet sights.

Remember every ounce of metal in the Buff transit is as if of hardest and toughest steel.

**Transits and Levels repaired on short notice at lowest prices**



## BUFF "PRECISE" TRANSIT—Continued.

6 $\frac{1}{4}$ -INCH BUFF "PRECISE" TRANSIT. No. 1A

Patented Nov. 6, 1900; Nov. 13, 1900; Feb. 3, 1903.

EACH \$

For specifications, see pages 319-321

No. 1 Plain Railroad Transit (without bubble or clamp to telescope) . . .

For extras, see page 321

Transits and Levels repaired on short notice at lowest prices



## BUFF "PRECISE" TRANSIT—Continued.



6¼-INCH BUFF "PRECISE" TRANSIT. No. 1B

(Design Patented)

Each, \$

For exact specifications, see pages 319-321

For extras see page 321

Transits and Levels repaired on short notice at lowest prices



## BUFF "PRECISE" TRANSIT—Continued.



6 $\frac{1}{4}$ -INCH BUFF "PRECISE" TRANSIT. No. 1C  
(Design Patented)

Each, \$

For exact specifications, see pages 319-321. The 5-inch full circle reading to minutes is protected by aluminum guard.

For extras, see page 321

Transits and Levels repaired on short notice at lowest prices



## BUFF "PRECISE" TRANSIT—Continued.



6 1/4-INCH PENNSYLVANIA "PRECISE." No. 1D

For specifications and extras, see pages 319-321. Can also be equipped with 2 1/2-inch compass.

Each, \$

For extras, see page 321

Transits and Levels repaired on short notice at lowest prices

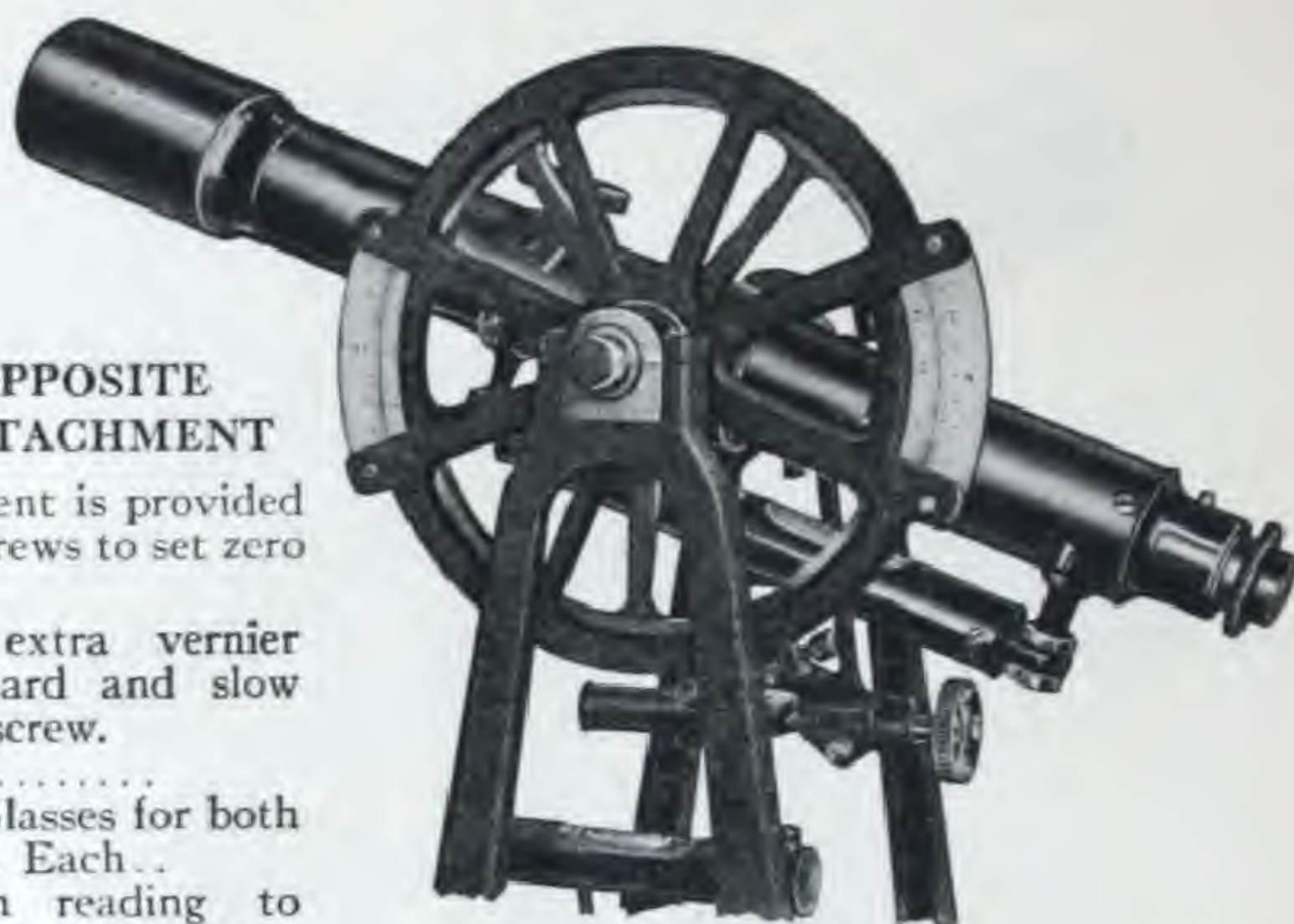


## BUFF "PRECISE" TRANSIT—Continued.

**DOUBLE OPPOSITE  
VERNIER ATTACHMENT**

This arrangement is provided with adjusting screws to set zero of vernier.

- 1-20 Price of extra vernier with guard and slow motion screw.  
Each.....
- 1-21 Reading Glasses for both verniers. Each..
- 1-22 Graduation reading to 30". A and B verniers.  
Each.....

**PHILADELPHIA ARC**

Optional with regular form of arc, page 323

**1-23  
REVERSION  
LEVEL**

For leveling with telescope reversed.

A guard is provided with this level to protect the under side of the vial when not in use.  
Each.....

Transits and Levels repaired on short notice at lowest prices





## BUFF "PRECISE" TRANSIT—Continued.



5 1/8-INCH BUFF "PRECISE" TRANSIT. No. 2B

This size of Engineers' Transit in design is identical with the regular larger size, but on account of decreased size and weight is admirably adapted for work of a reliable nature where a lighter weight instrument is desirable.

For specifications, see page 331

Each, \$

For extras, see page 331

Transits and Levels repaired on short notice at lowest prices



## BUFF No. 1E TRANSIT



No. 1E. 6¼-INCH HORIZONTAL GRADUATION

Each, \$

This model is one of the finest designs, combining the U-form of standard with a maximum size of compass. For specifications, see page 321.

**Transits and Levels repaired on short notice at lowest prices**

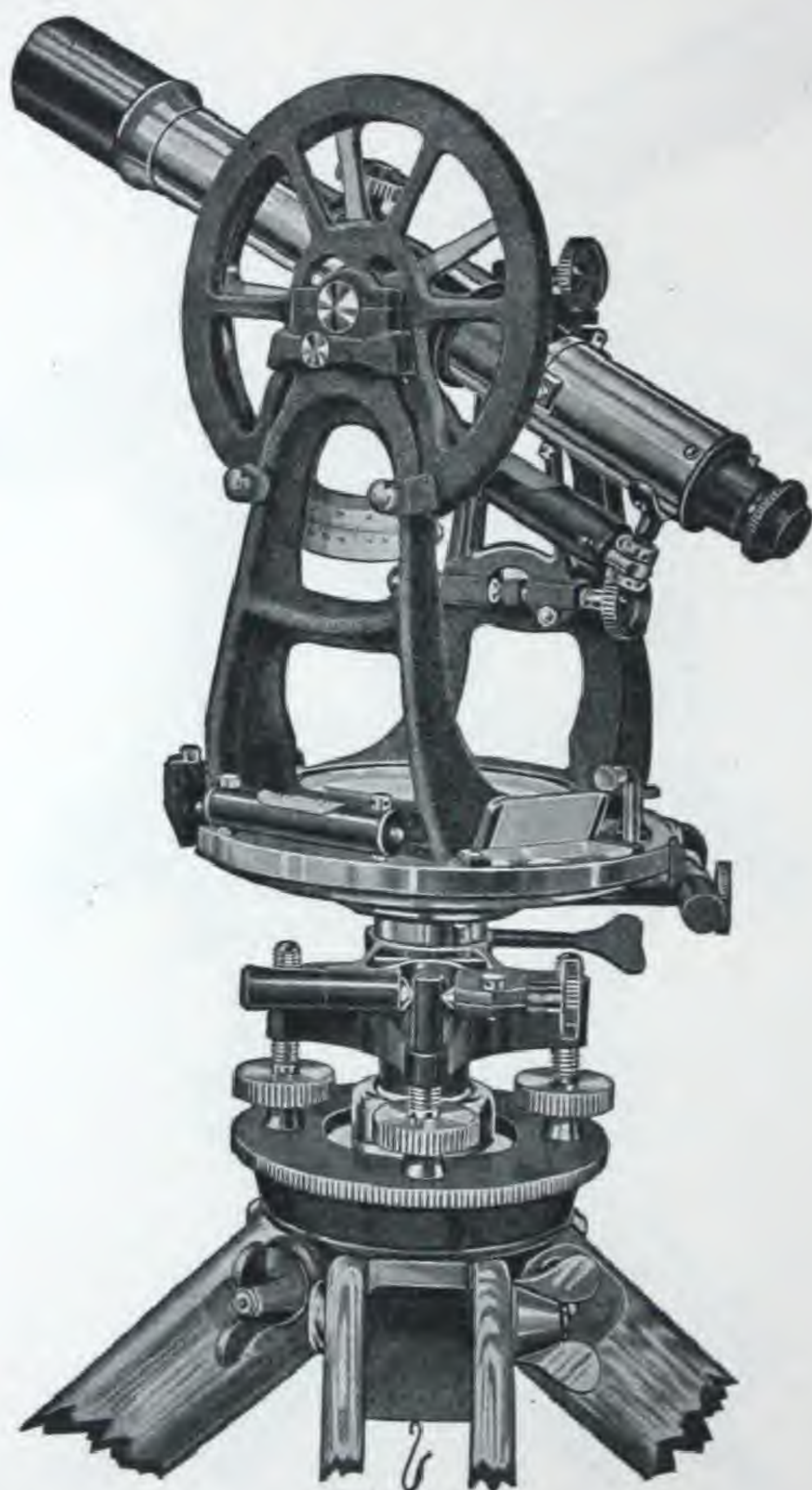


**6¼-INCH PENNSYLVANIA PRECISE, No. 1 D****FOR TUNNEL ALIGNMENT WORK**

Each, \$

Specifications and extras, page 321. Black Leather Finish for U standards, extra.



5 $\frac{1}{8}$ -INCH LIGHT MOUNTAIN UNIVERSITY, No. 2 E

Each, \$

This style combines the U standards and a maximum size of compass needle, 3 $\frac{1}{4}$  inches long. Extra light weight of but 9 pounds.

No. 2 $\frac{1}{2}$ E has the same specifications as No. 2E, except it has half circle in place of full circle. Each, \$

See page 331 for general specifications



## BUFF "PRECISE" TRANSIT—Continued.

## SPECIFICATIONS

## No. 2B

Graduation,  $5\frac{1}{8}$  inch diameter, with two double opposite verniers to minutes, placed at either 30 degrees or 90 degrees to line of sight. Two rows of figures 0-360 inclined. Graduations are silvered and covered by pure crystal plate glass. Vertical arc 5 inch diameter and reading to minutes by one double vernier.

Telescope, erecting or inverting, is perfectly balanced, and reverses at both ends. Length is  $10\frac{3}{4}$  inches, with aperture of  $1\frac{1}{4}$  inch, and power of 22.5 diameter. Eye-piece gives sharply-defined field of improved illumination.

Sensitive level bubble,  $5\frac{1}{2}$  inches long, with clamp and tangent to telescope.

Adjustment for vertical plane of telescope and line of collimation correct for all distances. Center point is provided on top of telescope.

Improved lower and upper spring tangent clamps and shifting center with  $\frac{5}{8}$ -inch adjustment.

Standards are cloth finished.

Long taper centers with wide flanges.

Compass needle  $3\frac{3}{4}$  inches long and of preferred form.

Tripod improved, split-leg form with thumb-nuts, weight 7 pounds.

Mahogany case is fitted with strap, lock and hooks, and contains plumb bob, pocket magnifier, sun shade, wrench, screwdriver, etc.

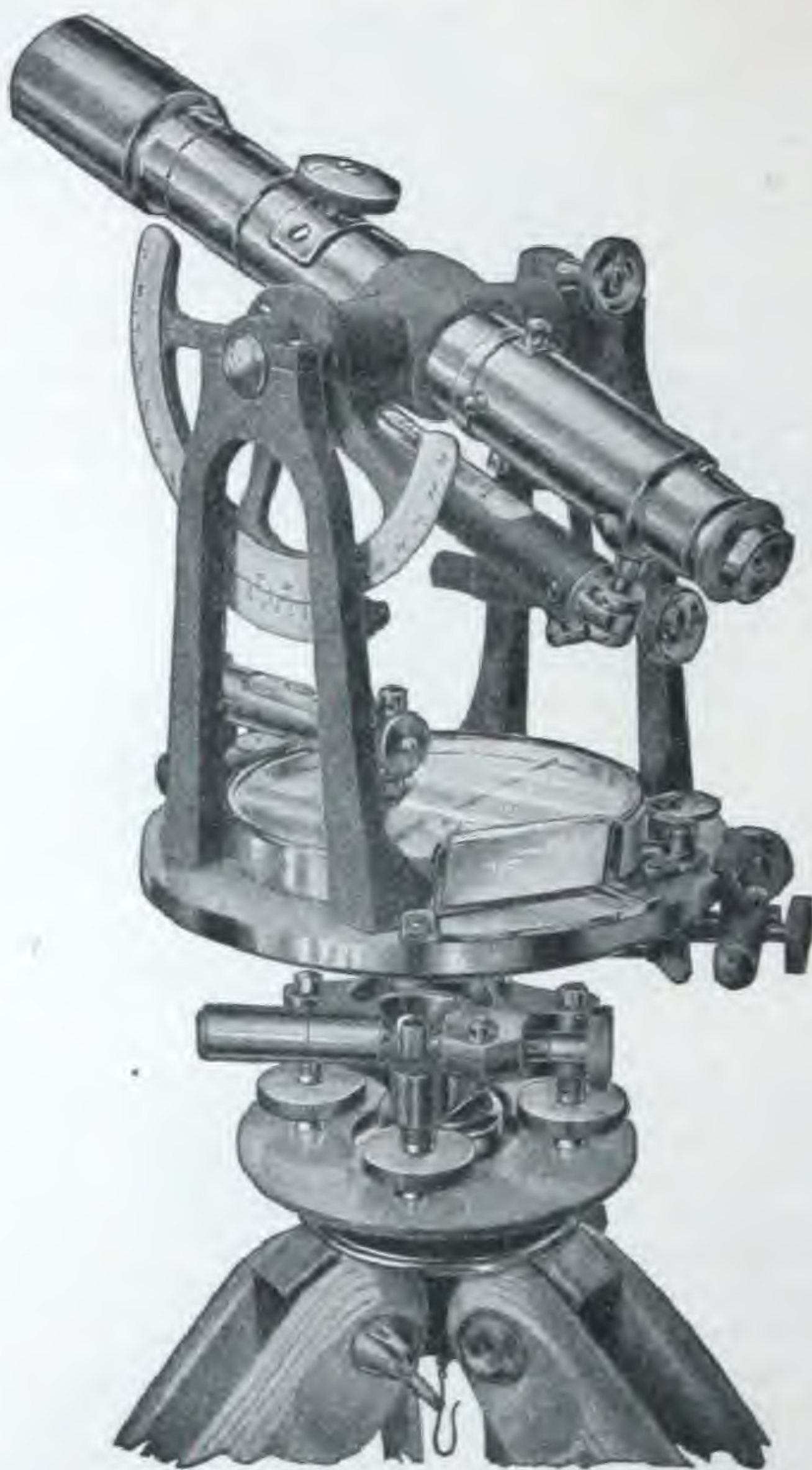
Option. Aluminum tripod head, reduces weight  $1\frac{1}{4}$  pounds.

## EXTRAS TO No. 2 SIZE OF TRANSIT

2-31	Graduation, horizontal circle, solid silver.....
2-32	Graduation, horizontal circle, reading to 30 seconds.....
2-33	Graduation, horizontal circle, reading to 20 seconds.....
2-34	Edge graduation for vertical circle, 5 inch diameter.....
2-35	Graduation, vertical circle, solid silver.....
2-36	Graduation, vertical circle, reading to 30 seconds.....
2-37	Standards finished bright or bronzed.....
2-38	Extra extension tripod, weight $9\frac{1}{2}$ pounds.....
2-39	Ground glass shades to vernier.....
2-40	Gradiometer attachment.....
2-41	Stadia wires, fixed.....
2-42	Variation plate and ring.....
2-43	Silk waterproof bag to cover instrument.....
2-44	Superfine watch oil, to lubricate centers.....
2-45	Reflector shade for cross wires.....
2-46	Short focus lens attachment.....

Transits and Levels repaired on short notice at lowest prices



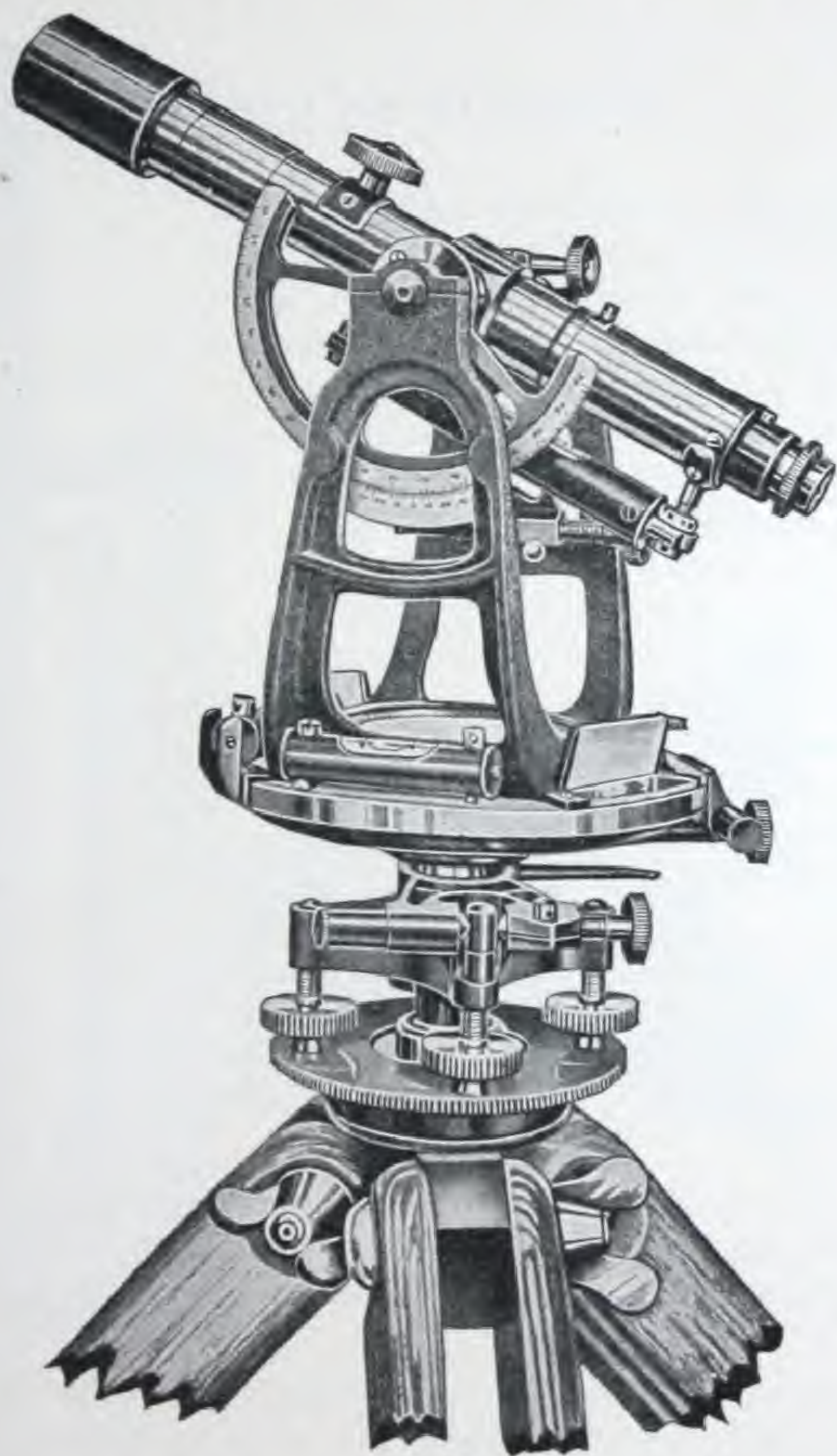
**4½-INCH BUFF RECONNAISSANCE TRANSIT, No. 3 B**

EACH \$

The difference of one-half inch in the diameter of the No. 3 and No. 4 is slight, but the difference on the graduation is more noticeable. The No. 3 has an increase of three-quarters of an inch in the length of needle.

**For Specifications and Extras, see page 334**



**4½-INCH UNIVERSITY MODEL, No. 3 E**

EACH \$

Designed for conservation engineers and fine mountain surveying where extreme conditions require extra strength and rigidity to withstand a strong breeze. Recommended for use with solar attachment.

For Specifications and Extras, see page 334



## EXTRAS TO No. 3 TRANSITS

EACH

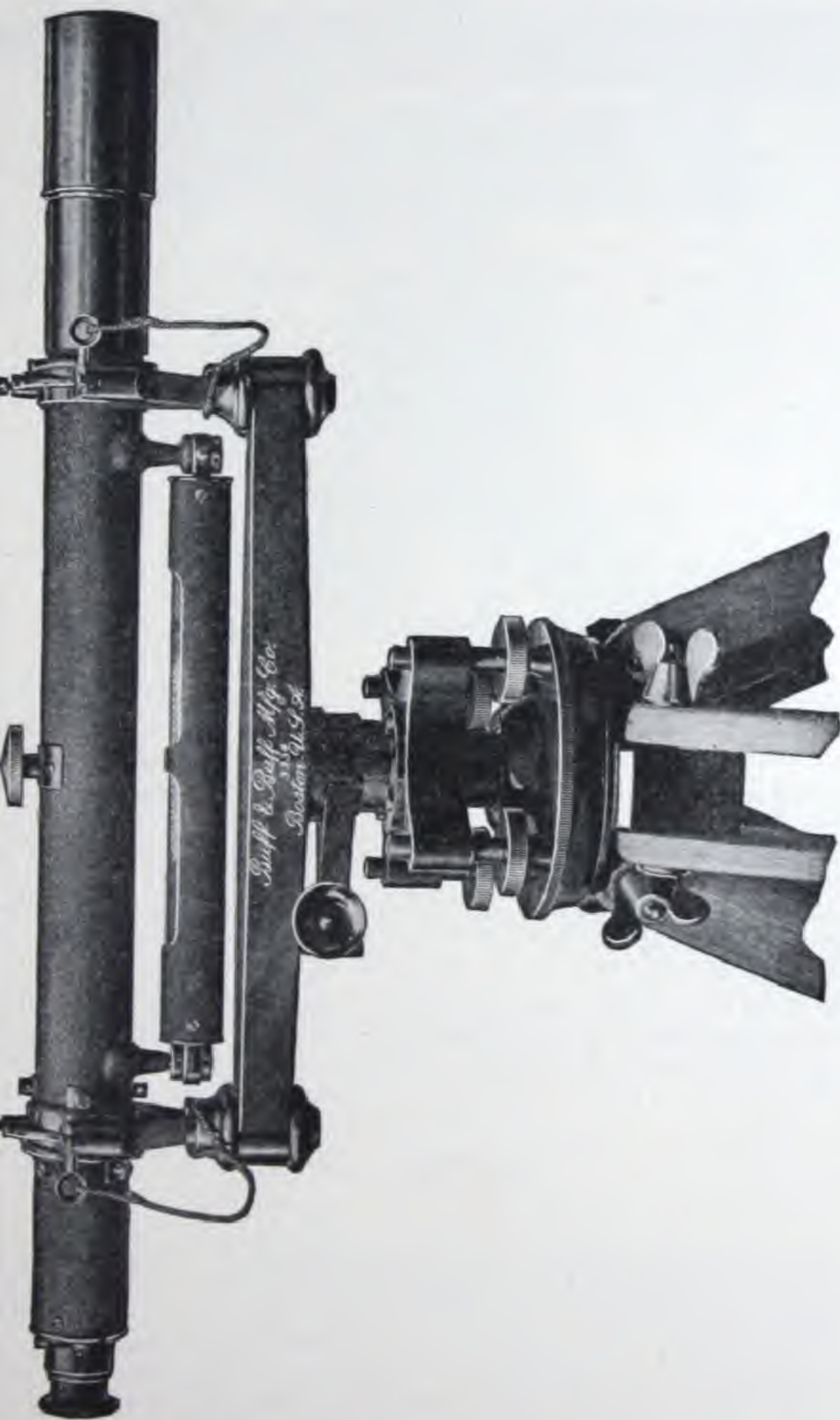
- 3-31—Graduation, horizontal circle, solid silver.....
- 3-32—Graduation, horizontal circle, reading to 30".....
- 3-33—Graduation, vertical circle, solid silver.....
- 3-34—Edge graduation to vertical circle, one double reading vernier.....
- 3-35—Dust-proof cover of crystal plate glass completing enclosure.....
- 3-36—Gradienter attachment, improved, guaranteed accurate.....
- 3-37—Stadia wires, fixed, 1 ft. to 100 ft.....
- 3-38—Two reading glasses to horizontal circle.....
- 3-39—Aluminum guard for circle.....
- 3-40—Prism, attachable to eye-piece, No. 1.....
- 3-41—Prism, attachable to eye-piece, pivoted combination, No. 2.....
- 3-42—Leather cover over case, sole leather, with carrying straps.....
- 3-43—Canvas cover with leather ends for extension tripod.....
- 3-44—Detachable side-telescope with counterpoise.....
- 3-45—Silk bag to cover transit, and bottle of superfine watch oil.....
- 3-46—Striding level to complete transit.....
- 3-47—Variation plate and ring.....
- 3-48—Reflector shade for illuminating cross wires.....
- 3-49—Short Focus lens attachment, No. 1, No. 2.....
- 3-50—Trivet—for setting on beams.....
- 3-51—Auxiliary Bubble to control zero of vertical vernier.....

We prefer to make these instruments with inverting eye-pieces, knowing that thereby the greater satisfaction will be obtained. If a detachable side-telescope is ordered, it should be on the instrument having the U-shaped standards.

For the use of explorers and reconnaissance surveyors, needing additional power, we offer in No. 3 transit an able instrument that can be used with the greatest satisfaction and accuracy in results.



## BUFF ENGINEERS' 18-INCH Y LEVEL



Power, with erecting eye-piece, 36 diameters.  
Complete, each \$

For specifications, see page 336.

Transits and Levels repaired on short notice at lowest prices



## BUFF ENGINEERS' 18-INCH WYE LEVEL

(Power, 36 Diameters)

The Buff 18-inch Wye Level is the longest level they stock. The Precision Level, costing \$400.00, and made per specifications of the U. S. Coast and Geodetic Survey, has the same lenses and 18-inch long telescope. A longer telescope makes the element of gravity and overhang a serious consideration. The power of the 18-inch telescope is more than ample—hence no requirement is valid for greater length of telescope. The Buff Level is constantly surprising the engineer on the remarkable results in his 6, 10 or 15-mile circuit.

The Improved Telescope is eighteen inches long and has  $1\frac{3}{8}$ -inch objective, giving increased illumination and clearness. Protection to object slide. Erecting or inverting eye-piece gives large, flat field of view. Entire telescope and level tube are cloth finished. Phosphor bronze contact points in wyes for the bell metal collars. Regular bell metal center in socket of phosphor bronze. Line of collimation correct for all distances. Instrument finally adjusted to the finest possible accuracy with sun-shade in position and focused on mean distance. Complete in mahogany case with strap and hooks, sun-shade, wrench, screwdriver, adjusting pins, etc.

Unless otherwise ordered on this level, the sensitiveness of spirit level will be what is rated as 10 seconds to 1-10" travel on scale.

Weight of complete instrument, about  $10\frac{3}{4}$  pounds. Tripod, 7 pounds.

Price, complete \$

The best metals for surveying instruments are those which have coefficients of expansion equal to that of glass. This is important in order to retain the adjustments despite temperature changes.

Coefficient of glass, per foot, for 1° Fah.....	.00005 inch
Coefficient of steel, per foot, for 1° Fah.....	.00007 inch
Coefficient of brass, per foot, for 1° Fah.....	.00012 inch
Coefficient of aluminum.....	.00014 inch

Steel or cast iron are nearest, and lighter and harder than brass. These metals might be adopted for the transit were it not for the compass needle. See following note for wye levels.

NOTE—For the most precise uses, where a specially sensitive spirit level is specified, the steel and iron center is strongly recommended as securing the most nearly perfect center theoretically as well as practically, and giving the ideal bearing.

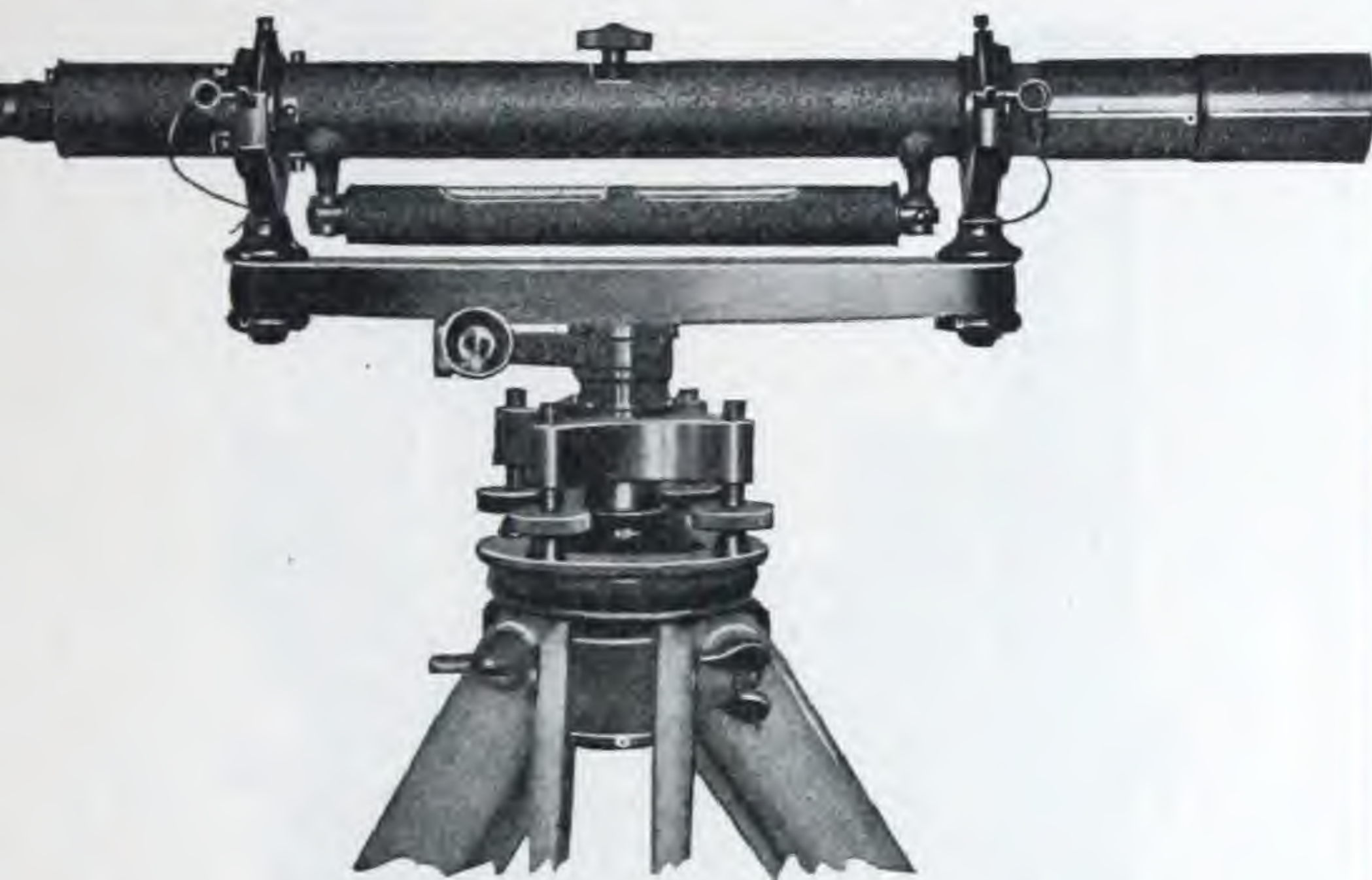
### EXTRAS

BYL-1	Hardened Steel Center in phosphor bronze socket.....
BYL-2	Hardened Steel Center in annealed iron.....
BYL-3	Fixed Stadia Wires.....
BYL-4	Extra Sun-Shade, having aperture for use when the light is too bright for accurate work.....
BYL-5	Metal Mirror, to read bubble without moving from eye-piece, silver-plated arms and jointed.....
BYL-6	Waterproof bag of rubber to protect the level from rain.....
BYL-7	Bottle of superfine Watch Oil to lubricate the centers.....

Transits and Levels repaired on short notice at lowest prices



### BUFF ENGINEERS' 14½-INCH WYE LEVEL



Power, 28 diameters. Similar to the preceding style level and complete with box and tripod.

Complete, each \$      Weight, 9½ pounds.

Aluminum bar on this instrument reduces the weight to 8 pounds.

#### SPECIAL

In all but one respect this level is fully the equal of its large prototype, but having a shorter telescope of less power, its sensitiveness is slightly cut down to correspond. The level bubble has the rating of 12 to 14 sec. sensitiveness.

Altogether this level is specially adapted to the closest work in mountain levelling where weight is an object, and where it is important to have a level capable of instant and accurate adjustment.

#### EXTRAS

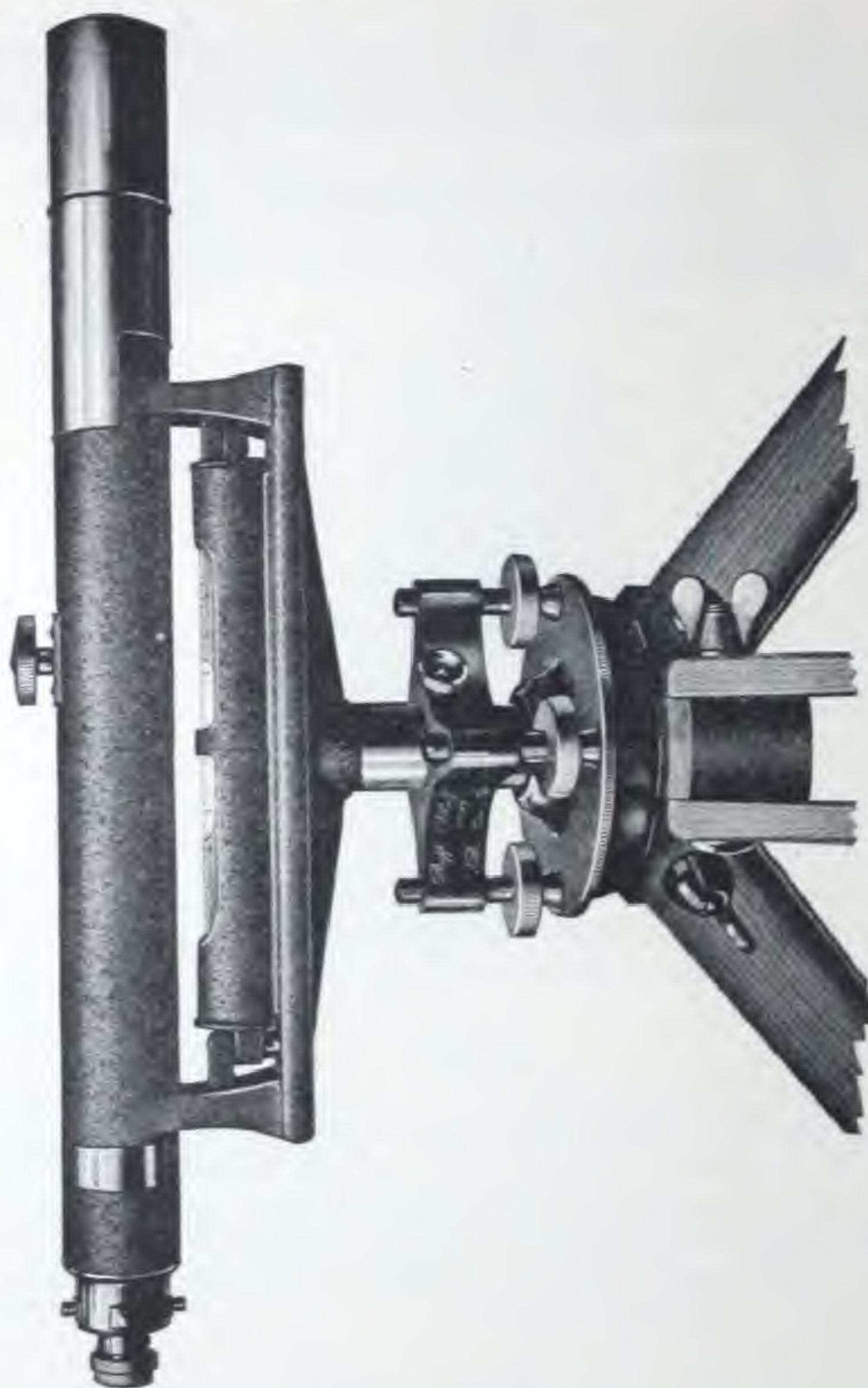
- BYL-11 Stadia wires, fixed.....
- BYL-12 Hardened steel center in socket of annealed iron.....
- BYL-13 Extra sun shade for use when sun's rays are too strong, having small aperture.....
- BYL-14 Gossamer rubber bag, for protection against the weather.....
- BYL-15 Bottle of superfine watch oil to lubricate the center.....

The clamp acts independent of the axis, so that it is impossible to throw the instrument out of adjustment when clamping.

**Transits and Levels repaired on short notice at lowest prices**



# BUFF ENGINEERS' 16-INCH DUMPY LEVEL



(Erecting Eye-piece)

Focusing screw placed on top. Protection to object-slide. Improved form of telescope barrel casting, of phosphor bronze, insuring great stability.

Center and lower bar of a single bell-metal casting, obtain utmost strength and permanency of adjustment.

Power, as above, 32 diameters. (Inverting eye-piece can be furnished at same price).

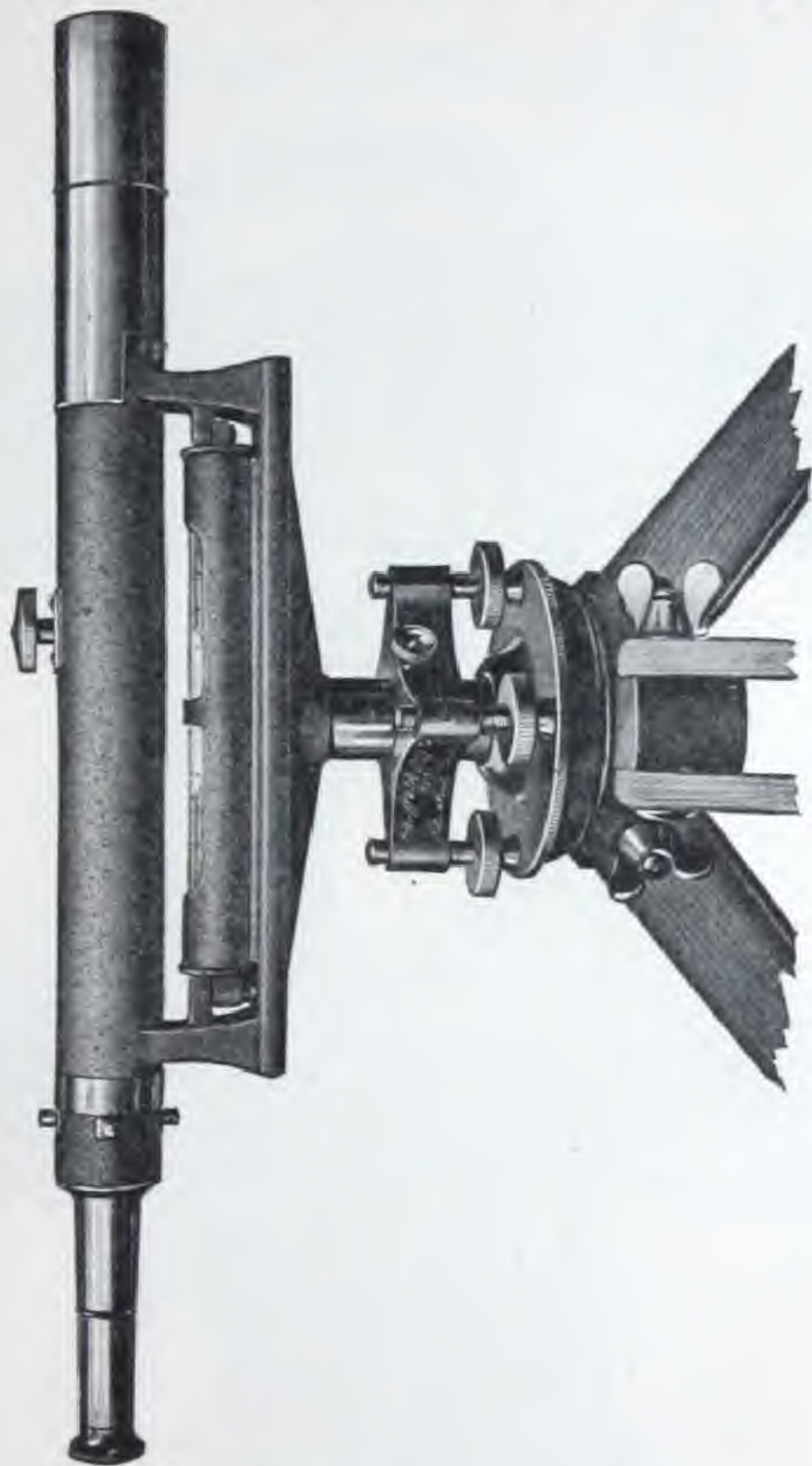
Price, with tripod and mahogany case.....

For extras see page 339

Transits and Levels repaired on short notice at lowest prices



## BUFF ENGINEERS' 18-INCH DUMPY LEVEL



(Erecting Eye-piece)

Remodeled design for cloth-finish posts, procuring maximum rigidity with least weight and graceful appearance. Recalculated lens system, obtaining sharply defined brilliant field.

Clamp screw to fix position of telescope.

With erecting eye-piece; power 32 diameters.

Price, with tripod and mahogany case..... \$

## EXTRAS

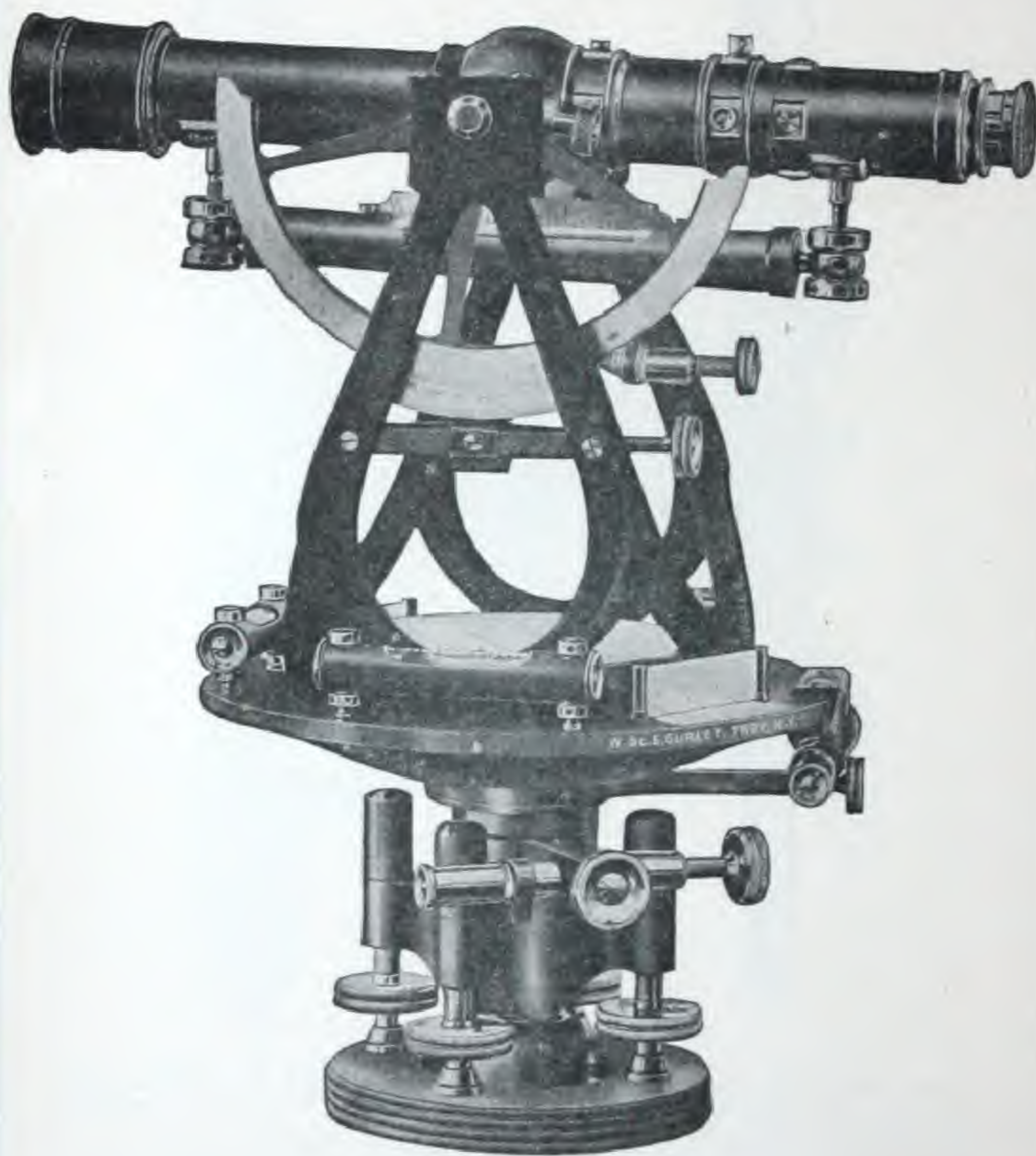
- BDL-21 Stadia wires, fixed.....  
 BDL-22 Rubber cover of heavy sheeting for protection against weather  
 BDL-23 Bottle of watch oil.....  
 BDL-24 Instrument provided with clamp and tangent screw.....

**Transit and Levels repaired on short notice at lowest prices**



## GURLEY PRECISE TRANSITS

TWO SIZES



Nos. G9A or G28A

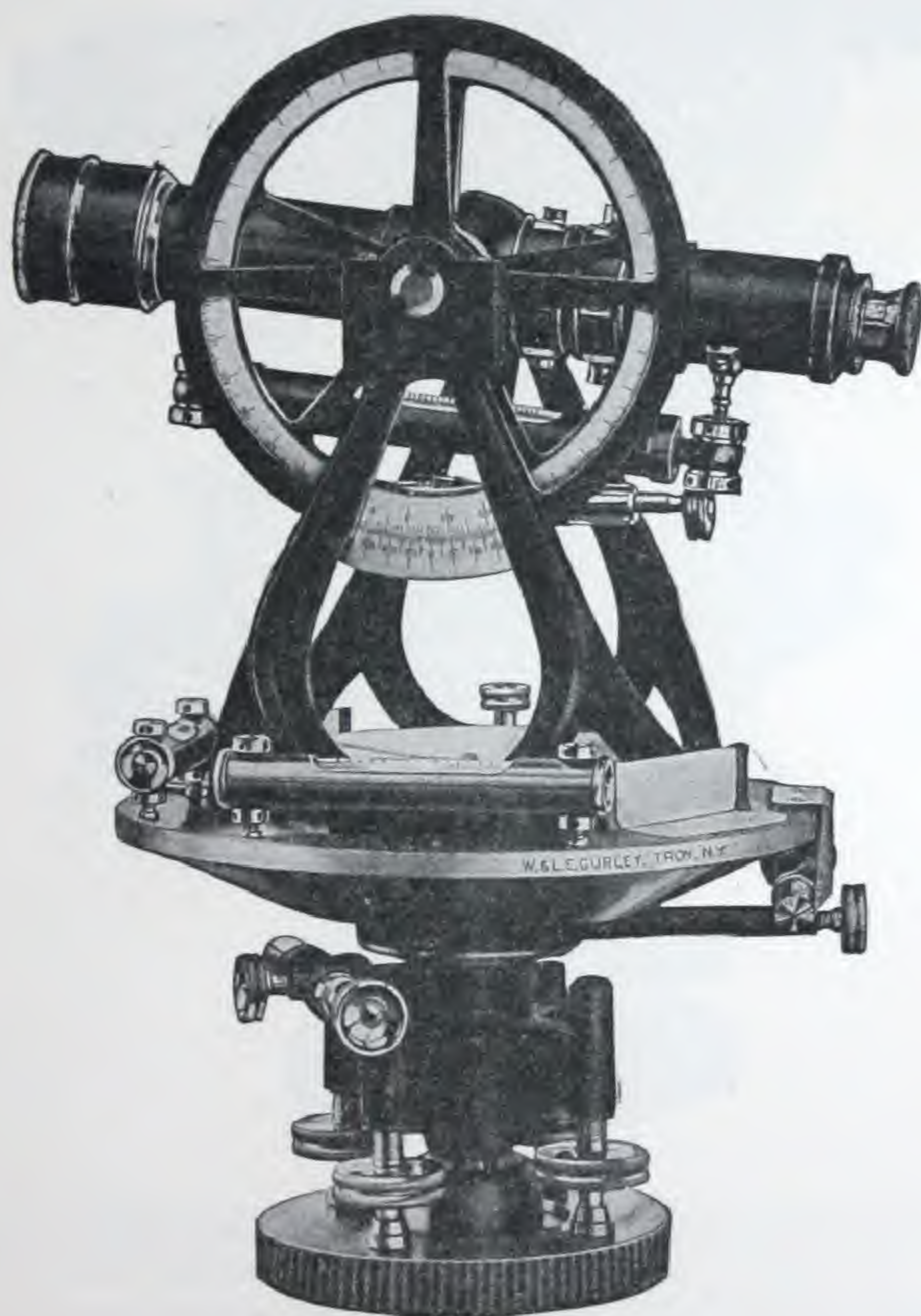
EACH

- G9A 6.25 in. limb, 3.5 in. needle, 11 in. telescope, weight 16.5 lbs....  
G28A 5.65 in. limb, 3 in. needle, 8 in. telescope, weight 12 lbs....



## GURLEY PRECISE TRANSITS

TWO SIZES



G27A

EACH

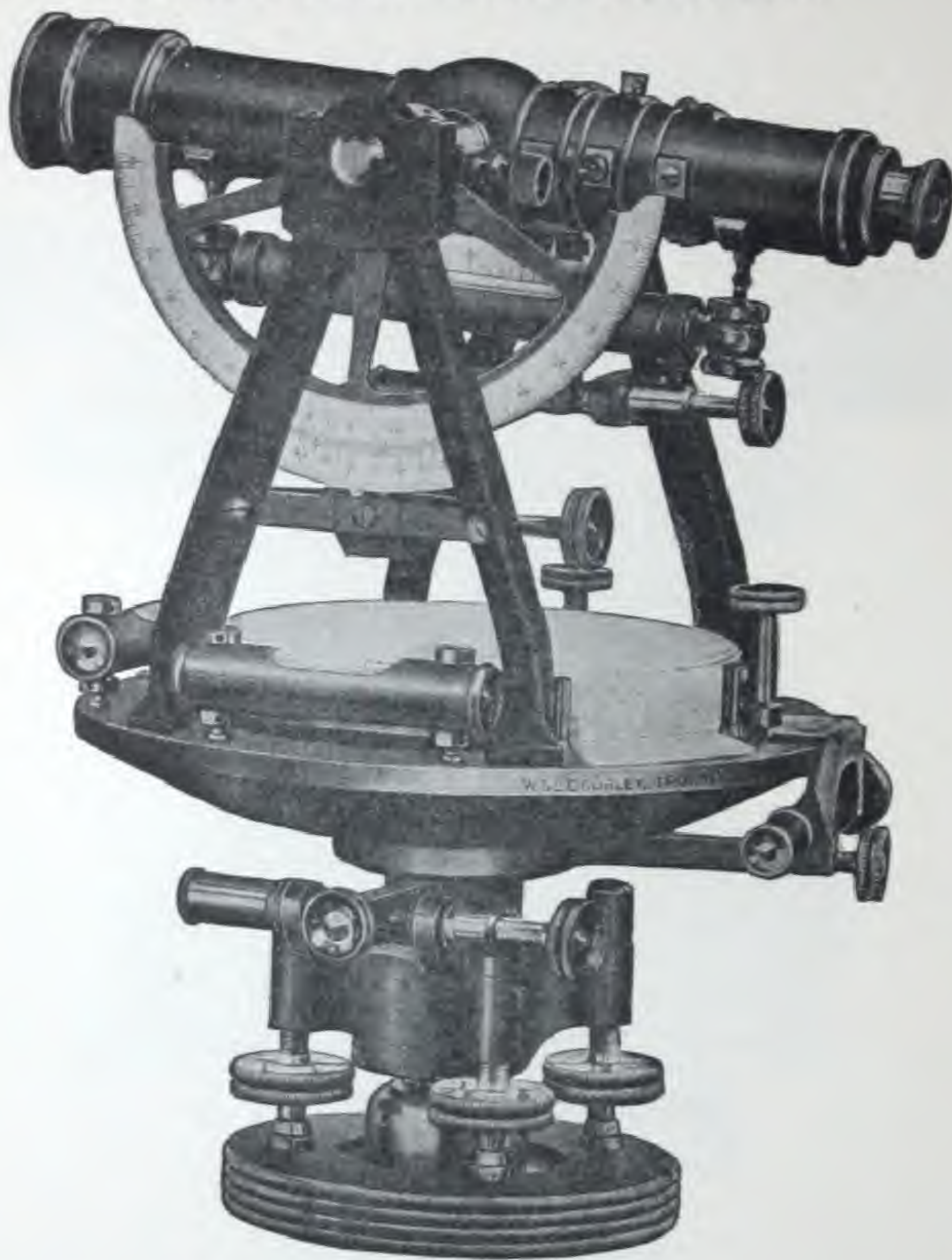
**G14A** 6.7 in. limb, 3.5 in. needle, 11 in. telescope, weight 18.1 lbs....

**G27A** 5.65 in. limb, 3 in. needle, 8 in. telescope, weight 11.7 lbs....

Attachments: Vertical limb, full circle, 5 inches diameter, (4.5 inches diameter on No. G27A,) reading by vernier to 1 minute; with guard; level on telescope; clamp and tangent to telescope axis.



## GURLEY LIGHT MOUNTAIN TRANSIT



G28

EACH

- G25 Light Mountain Transit, 4-inch needle, variation arc, two verniers to limb, telescope of finest quality, power twenty diameters, with stadia, extension tripod shortening to half length. The instrument is packed in a mahogany case, covered with a light sole leather case, with straps for "packing." With plain telescope eight inches long.
- G26 Light Mountain Transit, with level on telescope, and clamp and tangent to telescope axis.
- G27 Light Mountain Transit, with  $4\frac{1}{2}$ -inch vertical circle, level on telescope, and clamp and tangent to telescope axis.
- G28 Light Mountain Transit, with vertical arc of  $2\frac{1}{2}$  inches radius, with vernier moved by tangent screw, level on telescope, and clamp and tangent to telescope axis, as shown.
- G29 Light Mountain Transit, with vertical arc of  $2\frac{1}{2}$  inches radius, with vernier moved by tangent screw, level on telescope, and gradienter combined with clamp and tangent to telescope axis.

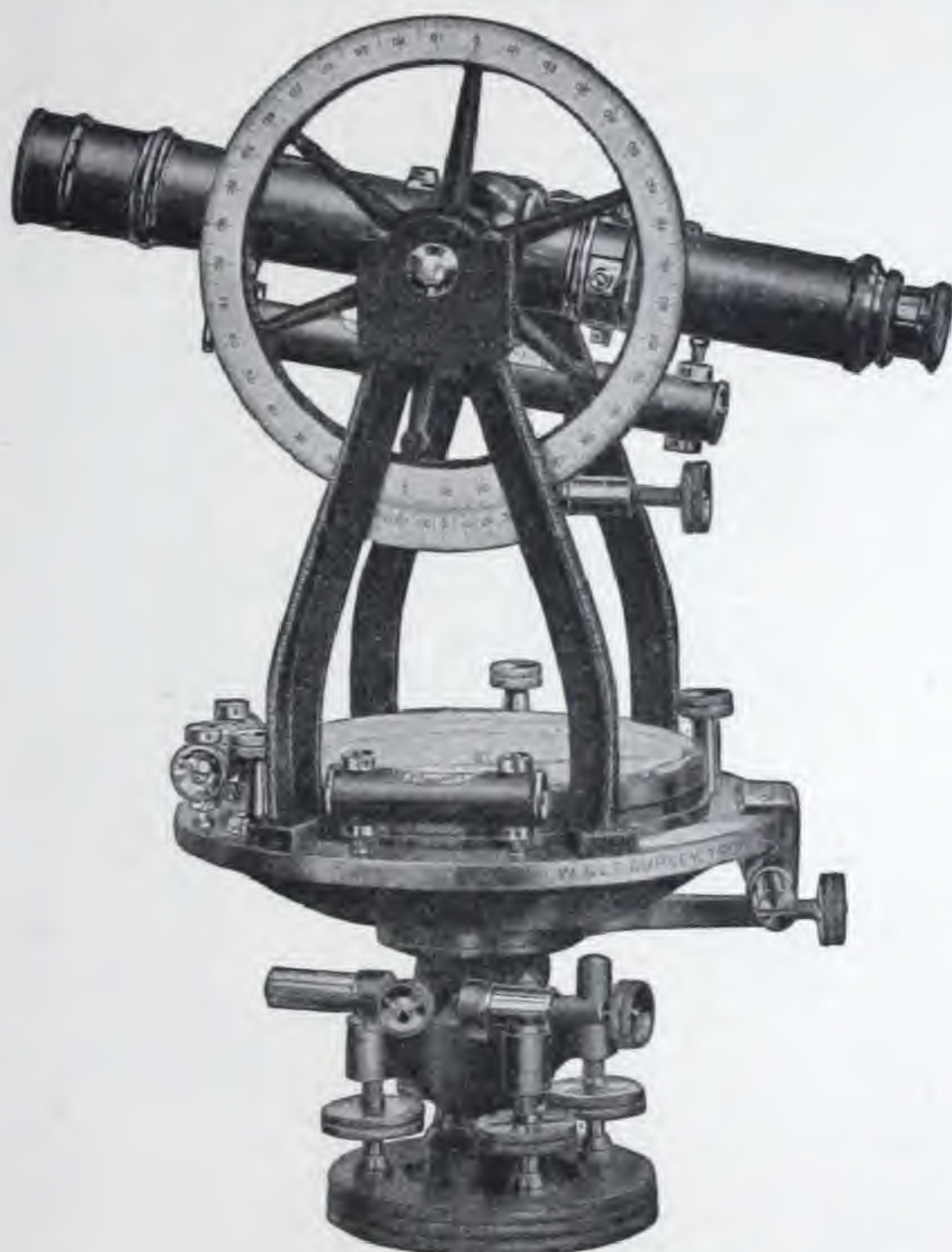
See page 344 for extras for Gurley Transits

Transits and Levels repaired on short notice at lowest prices



## GURLEY RECONNOISSANCE TRANSITS

ONE SIZE. ONE VERNIER TO LIMB.



G102

The Gurley Reconnaissance Transit meets the demand for a very light instrument for rapid work. Constructed like the Mountain Transits, with long centers and with ribbed leveling head, limb and main plate, and made with the same care as the larger and more expensive patterns, it is recommended as reliable for a great variety of work.

Its accuracy, its convenience in carrying, and its proved ability to stand up satisfactorily under severe use, have made this transit especially popular with Surveyors, Contractors, Road Engineers, Architects and Builders.

**G102** Reconnaissance Transit, one vernier to limb,  $3\frac{1}{2}$ -inch needle, with  $3\frac{1}{2}$ -inch vertical circle and vernier reading to five minutes, level on telescope, clamp and tangent to telescope axis, and leveling tripod with extension legs. . . . .

EACH

**G103** Reconnaissance Transit, same as No. G102 except the vertical limb is an arc of 2.5 in. radius to 30 minutes and reads by one double vernier to 1 minute, the vernier movable by tangent. . . . .

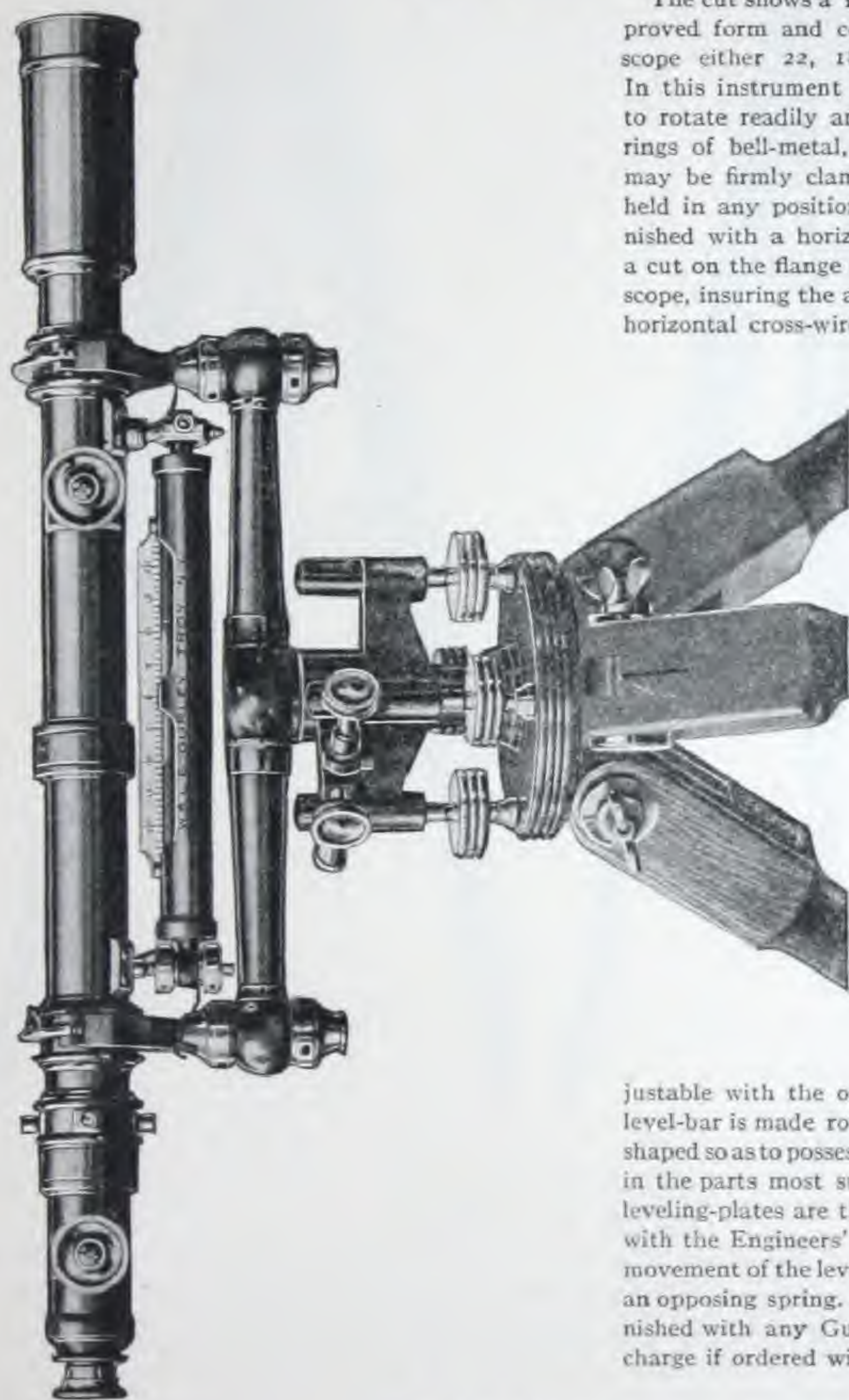
Transits and Levels repaired on short notice at lowest prices



## ATTACHMENTS AND EXTRAS FOR GURLEY TRANSITS

	EACH
G5A Variation Arc added to Transits when sent for repairs.....	
G5B Certical Circle, 4 in. diameter, with vernier reading to 1 minute.....	
G5C Vertical Circle, 4.5 in. diameter, with vernier reading to 1 minute.....	
G5D Vertical Circle, 5 in. diameter, with vernier reading to 1 minute.....	
G5E Vertical Circle, 5 in. diameter, with two opposite double verniers, reading to 1 minute, and with guard.....	
G5F Vertical Circle, 4.5 in. diameter, with graduations on edge or rim, protected by a metal guard. Circle graduated to 30 minutes, with vernier reading to 1 minute.....	
G5G Vertical Arc, 2 in. radius, with vernier reading to 1 minute, movable by tangent screw	
G5H Vertical Arc, 2.5 in. radius, with vernier reading to 1 minute, movable by tangent screw	
G5J Vertical Arc, 3 in. radius, with vernier reading to 1 minute, movable by tangent screw	
G5K Detachable Aluminum Guard for Vertical Circle.....	
G5L Level on Telescope, with ground and graduated vial.....	
G5M Level on Telescope, with Reversion Vial.....	
G5N Clamp and Tangent to Telescope Axis.....	
G5P Beaman Stadia Arc, for Transit having a one-vernier vertical circle or vertical arc...	
G5Q Beaman Stadia Arc, for Transit having a two-vernier vertical circle.....	
G5R Beaman Stadia Arc, for Telescope Alidades.....	
G5S Beaman Stadia Arc with edge graduations.....	
G5T Gradiometer, combined with Clamp and Tangent.....	
G5U Platinum Stadia Wires, adjustable, and diaphragm.....	
G5V Platinum Stadia Wires, fixed and diaphragm.....	
G5W Dust Guard to objective slide.....	
G5X Pinion movement to eyepiece slide.....	
G5Y Sights on Telescope, with folding joints.....	
G5Z Sights on Standards, at right angles with telescope.....	
G6A Detachable Side Telescope and Counterpoise, for vertical sighting.....	
G6B Detachable Riding Telescope, for vertical sighting.....	
G6C Reflector for illuminating cross wires.....	
G6D Reflector for illuminating cross wires of large Wye Level.....	
G6E Elbow Eyepiece, in addition to regular eyepiece, and interchangeable.....	
G6F Diagonal Prism for eyepiece of telescope.....	
G6G Eyepiece Cap with darkener glass in shutter, for direct solar observations.....	
G6H Attached Magnifier, with three universal joints, to read verniers.....	
G6J Attached Microscopes to read verniers of horizontal limb, as shown with No. 18A Transit.....	
G6K Attached Microscopes to read verniers of No. 138 vertical limb, as shown with No. 18A Transit.....	
G6L Graduation of horizontal limb to read to 20 or 30 seconds, extra.....	
G6M Graduation of horizontal limb to read to 10 seconds, extra.....	
G6N Graduation of 4.5 or 5 in. Vertical Circle to read 20 or 30 seconds, extra.....	
G6P Graduation of No. 138 Vertical Circle to read to 20 or 30 seconds, extra.....	
G6Q Graduation of No. 138 Vertical Circle to read to 10 seconds.....	
G6R Burt Solar Attachment, with declination arc, hour circle, polar axis, patent latitude level, adjusting level and adjusting bar.....	
G6S Solar Screen, to fit eyepiece of telescope.....	
G6T Patent Latitude Level, for use with Burt Solar Transit.....	
G6U Striding or Adjusting Level.....	
G6V Adjusting Bar for Solar Attachment of Transit.....	



**GURLEY Y LEVEL****G 376. 18-inch Y Level**

The cut shows a Y Level of the most improved form and construction, with telescope either 22, 18 or 15 inches long. In this instrument the telescope is made to rotate readily and truly in the Ys on rings of bell-metal, which, when desired, may be firmly clamped by the clips and held in any position. One Y clip is furnished with a horizontal stud fitting into a cut on the flange of the ring of the telescope, insuring the accurate position of the horizontal cross-wire. It has a rack and

pinion movement to both object-glass and eyepiece, and adjustment for centering the eyepiece, and another for insuring the accurate projection of the object-glass in a straight line. Both of these are completely concealed from observation and disturbance by thin bands which screw over them. The Ys of this level are made large and strong, of the best bell-metal, and each has two nuts, both being ad-

justable with the ordinary steel-pin. The level-bar is made round, of fine bronze, and shaped so as to possess the greatest strength in the parts most subject to strains. The leveling-plates are the same as those used with the Engineers' Transit. The tangent movement of the leveling-head is made with an opposing spring. Stadia wires are furnished with any Gurley Y Levels, free of charge if ordered with the instrument.

**ENGINEERS' Y LEVELS**

- |             |  |             |
|-------------|--|-------------|
| <b>G375</b> | Y Level, 22-inch telescope, with leveling screws, clamp and tangent and tripod . . . | <b>EACH</b> |
| <b>G377</b> | Y Level, 18-inch telescope, with leveling screws, clamp and tangent and tripod . . . |             |
| <b>G378</b> | Y Level, 15-inch telescope, with leveling screws, clamp and tangent and tripod . . . |             |

**NOTE.**—A Horizontal Circle,  $3\frac{1}{2}$  inches in diameter, is fitted at an additional price, when desired, to the levelinghead of these Y Levels. The circle is graduated to whole degrees, and is read by vernier to five minutes.

**Transits and Levels repaired on short notice at lowest prices**



## ELLIOTT TRIPODS



4275-6

4277-8

## TRANSIT TRIPODS

- 4275 Split Leg Tripod for Elliott Transits Nos. 11008, 11009.....  
 4276 Split Leg Tripod for Elliott Transits Nos. 11008, 11009.....  
 4277 Extension Tripod for Elliott Transits Nos. 11008, 11009.....  
 4278 Extension Tripod for Elliott Transit No. 11011.....

EACH

## LEVEL TRIPODS

- 4279 Split Leg Tripod for Elliott Levels No. 11010.....  
 4280 Extension Tripod for Elliott Levels No. 11010.....  
 4281 Solid Leg Tripod for Elliott Levels Nos. 11013 to 11016.....

EACH

Transit and Level Tripods Nos. 11008, 11009, 11010 are interchangeable.

Transits and Levels repaired on short notice at lowest prices



## GURLEY TRIPODS



## TRANSIT TRIPODS

- |      |  |
|------|--|
| 4285 | Plain Tripod for Gurley Transits Nos. G9A to G103.....     |
| 4287 | Split-Leg Tripod for Gurley Transits Nos. G9A to G103..... |
| 4289 | Extension Tripod for Gurley Transits Nos. G9A to G103..... |

## LEVEL TRIPODS

- 4291 Plain Tripod for Gurley Levels Nos. G375 to G378.....
- 4292 Split-Leg Tripod for Gurley Levels Nos. G375 to G378.....
- 4293 Extension Tripod for Gurley Levels Nos. G375 to G378.....

**Transits and Levels repaired on short notice at lowest prices**



## WATER STAGE REGISTERS

### THE USE OF WATER STAGE REGISTERS

The growing importance of water power development, the great possibilities for its use in irrigation and the many other ways in which this great gift of nature may be employed in the service of man, have made more essential, as in recent years its value has been better appreciated, the accurate determination of the volume of water in streams available for such use.

The energy of some of the foremost engineers in the world has been enlisted in the work, and both methods and appliances have been perfected as the result of experience.

For many years Gurley Current Meters have been in use in all parts of the world and are considered standard in determining the velocity of the flow of water in streams.

The discharge of a stream is usually ascertained by a comparison of gage heights with a rating table of the discharge of the stream at varying heights, compiled from a series of current meter observations.

The greatest error in these estimates is due to inaccurate determination of the gage heights, ordinarily secured from a few observations taken during the day, or even more infrequently.

It has been found that on many streams there is a considerable daily fluctuation due to natural or artificial control, making it impossible to obtain accurate gage heights without the use of an automatic register which will record the height of water at regular intervals during the entire twenty-four hours, or over a longer period of time.

In the endeavor to produce instruments satisfactory for such purposes, we have for several years been engaged in designing Water Stage Registers by which the varying height of water in streams may be gaged and a dependable continuous record be obtained.

As a result of our efforts, coupled with the suggestions made by eminent engineers, familiar with the problems involved, we have produced several patterns of Water Stage Registers which are satisfactorily meeting the demands of the service for reliable instruments giving accurate and uniform records.

Automatic Water Stage Registers are divided into two classes—those making a printed record, and those making a graphic record. In the first type a printed record of the height and time is made, while in the second type the record is traced by a pen or pencil on the surface of a paper sheet, moving in harmony with the time and height.

The first type of register is designed to give printed records of the rise and fall of water continuously for a long period of time, and is especially adapted for stations where it is impractical or impossible, by reason of inaccessibility, for the observer to visit the station for long intervals of time and where the record to be of service should be continuous.

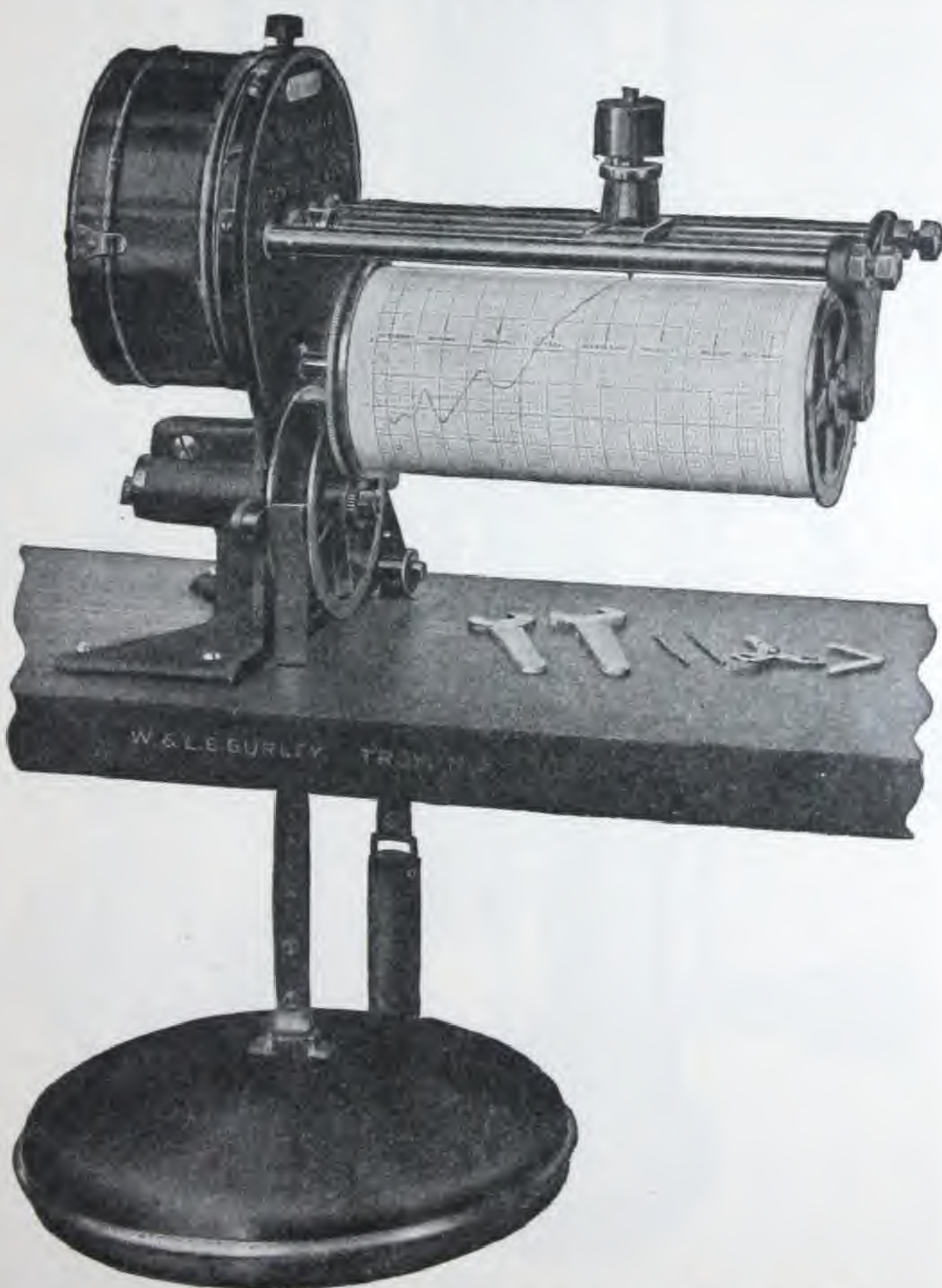
**A Special Catalog mailed upon request**



**GURLEY GRAPHIC WATER STAGE REGISTERS**

Normal Range, 0 to 10 feet

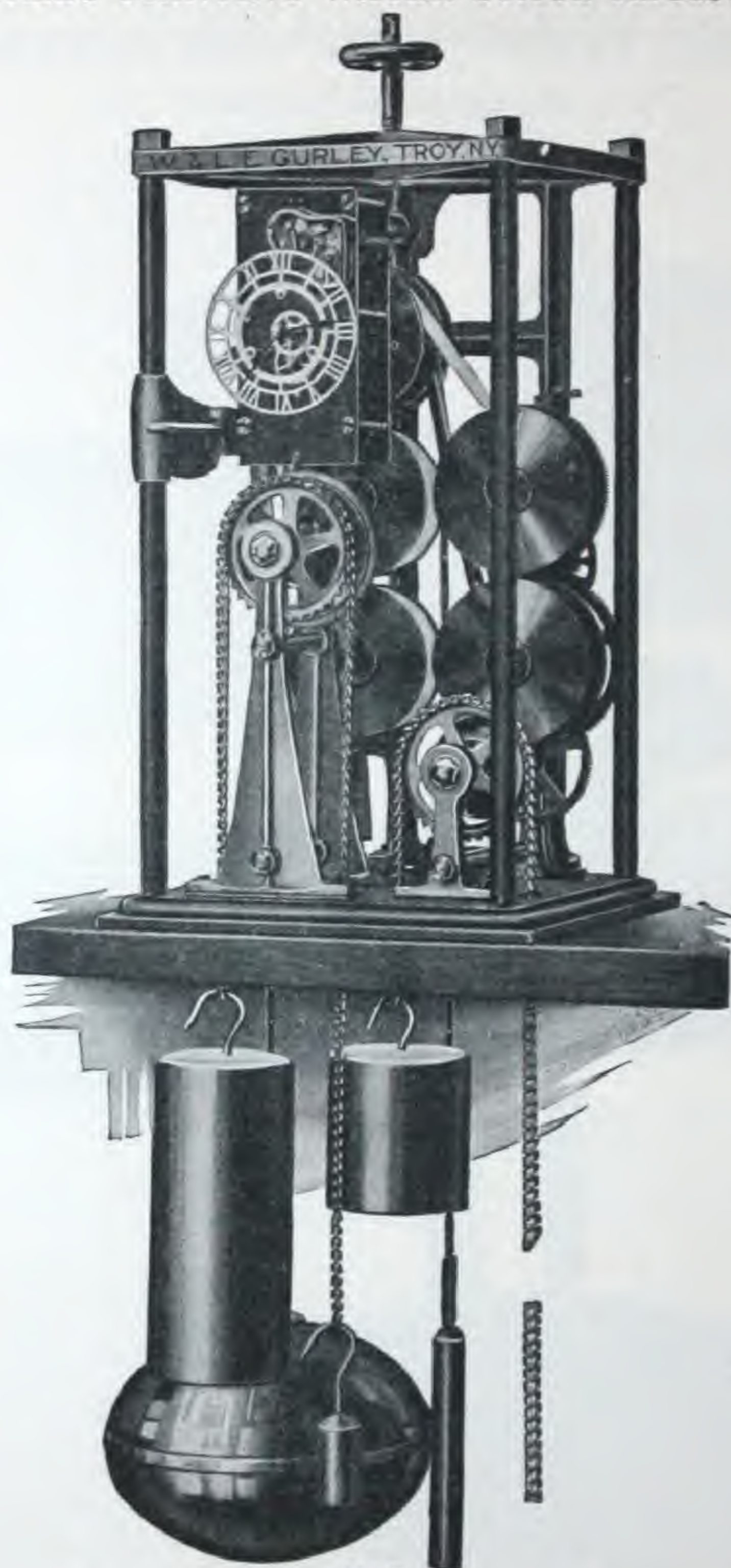
Time Scale, 7 days



633G. Graphic Water Stage Register—Spring-driven Clock, Each, \$



## GURLEY PRINTING WATER STAGE REGISTER



630G

Printing Water Stage Register, Each, \$  
Front view, showing clock, float and weights

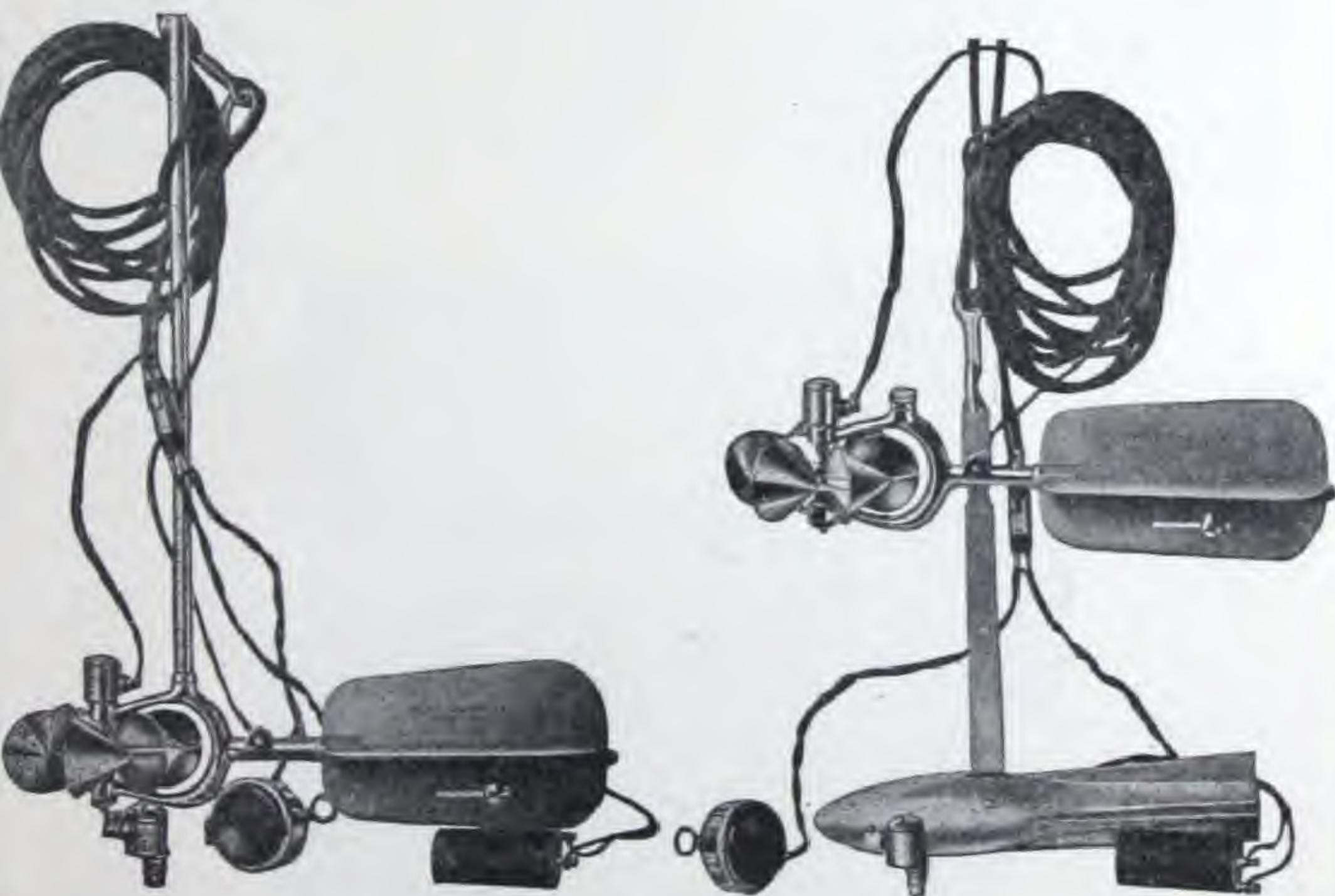


## GURLEY CURRENT METERS

All of the advantages of the preceding types are combined in Meter No. 623G, which can be suspended by cable or by jointed wading rod, and which is equipped with two interchangeable commutator boxes for indicating each revolution, or each fifth revolution, of the bucket wheel.

The combination of these features provides an outfit which has been adopted as standard by the most efficient hydraulic engineers. This meter is used extensively by the Water Resources Branch of the United States Geological Survey, the leading organization devoted to the precise measurement of water.

Two contact chambers, one to indicate each revolution, the other each fifth revolution of the bucket wheel, are provided. These contact chambers may be readily interchanged, the only change being in the shaft and consisting of the insertion of a cam on the end of the bucket shaft when a single revolution is to be indicated, or the insertion of a worm when it is desired to indicate every fifth revolution.

**623G**

Electric Current Meter Outfit, with meter suspended by jointed wading rods, and with telephone sounder, cable, dry cell battery, and extra commutator box, indicating each, or each fifth, revolution. Each, \$

**624G**

Electric Current Meter Outfit, with meter suspended by cable, and with telephone sounder, cable, dry cell battery, and extra commutator box, indicating each, or each fifth, revolution. Each, \$

A Special Catalog mailed upon request



## GURLEY CURRENT METERS

(Price Patents)

U. S. Geological Survey Standard

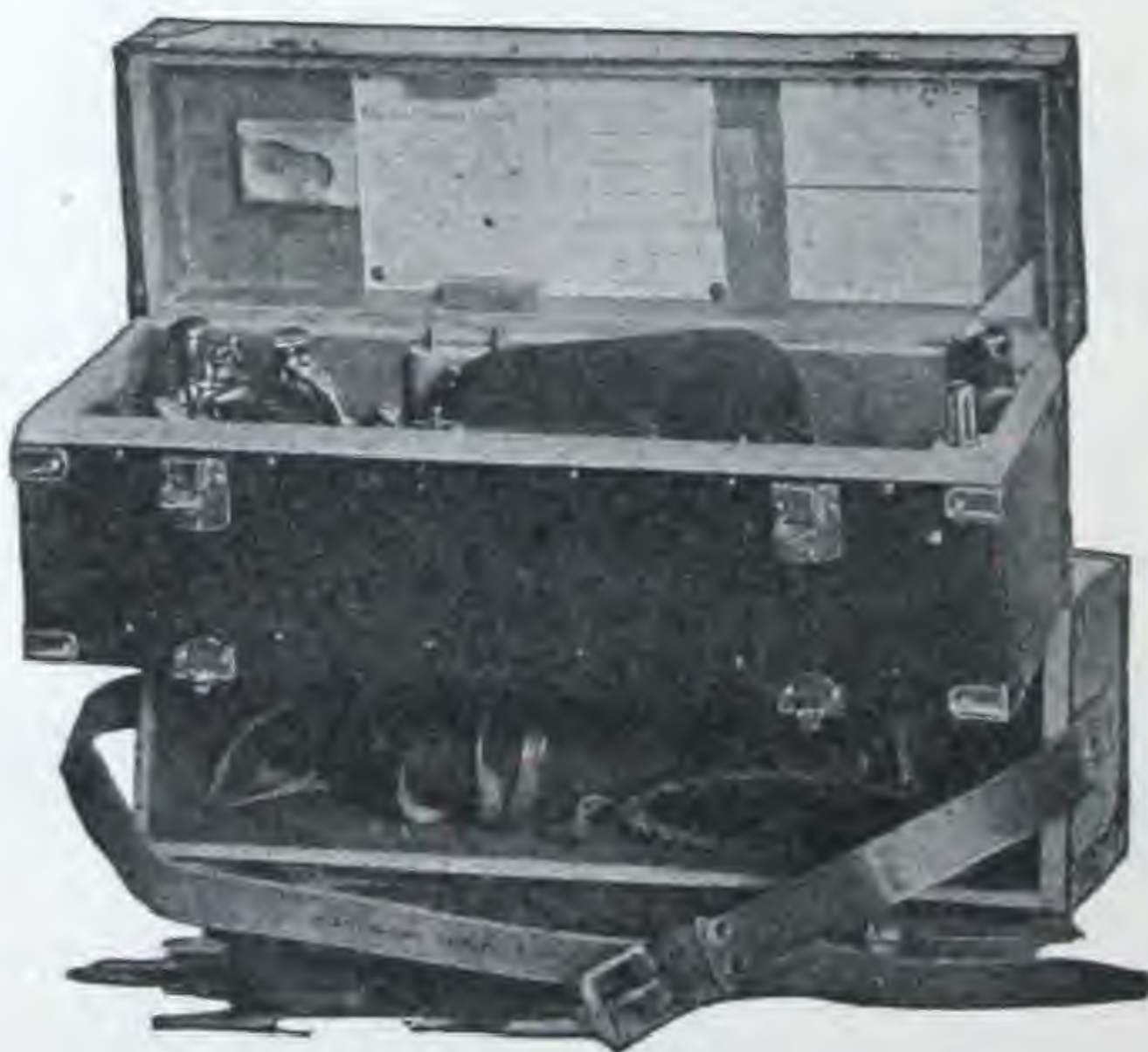
**For determining the Velocity of the Flow of Water in Harbors,  
Rivers, Streams, Sewers and Irrigation Ditches**

For more than thirty years W. & L. E. Gurley have made Current Meters under the patents of W. G. Price, the Assistant Engineer of the Corps of Engineers, United States Army, who in 1885 devised the initial pattern. The general features are retained in the latest models, although somewhat modified as the result of suggestions from many hydraulic engineers who have had large experience in current meter observation under all conditions of service.

The many hundreds of Gurley Current Meters in use in all parts of the world, their constantly increasing sale and their accuracy and reliability under all conditions, show that they are the standard instruments for the accurate measurement of the velocity of water in streams and open conduits.

A current meter for measuring the velocity of flowing water comprises two essential parts: (a) a wheel arranged so that when suspended in flowing water the pressure of the water against it causes it to revolve; (b) a device for recording or indicating the number of revolutions of this wheel. The relation between the velocity of the moving water and the revolutions of the wheel is determined by rating each meter.

The distinguishing characteristics of a good current meter are (a) simplicity in construction, with no delicate parts which easily get out of order; (b) a small area of resistance to the velocity of the water; (c) a simple and effective device for indicating the number of revolutions of the wheel; and (d) easy adaptability to use under all conditions.



625G

EACH

**625G** Special Carrying Case of fibre, for Current Meters, having two compartments, one for meter and the other for lead weight, cable, sounder, etc., as shown.....

**A Special Catalog mailed upon request**



## THE BRUNTON PATENT POCKET TRANSIT



4300 with 4301 and 4302

- 4300 Improved Type Brunton Pocket Transit.....
- 4301 Ball and Socket Tripod Head.....
- 4302 Tubular Extension Tripod.....
- 4303 Leather Case for instrument only.....
- 4304 Leather Case with belt loop for instrument only.....
- 4305 Leather Case with sling strap for instrument only.....
- 4306 Leather Case for instrument, tripod head and tripod with sling strap.....

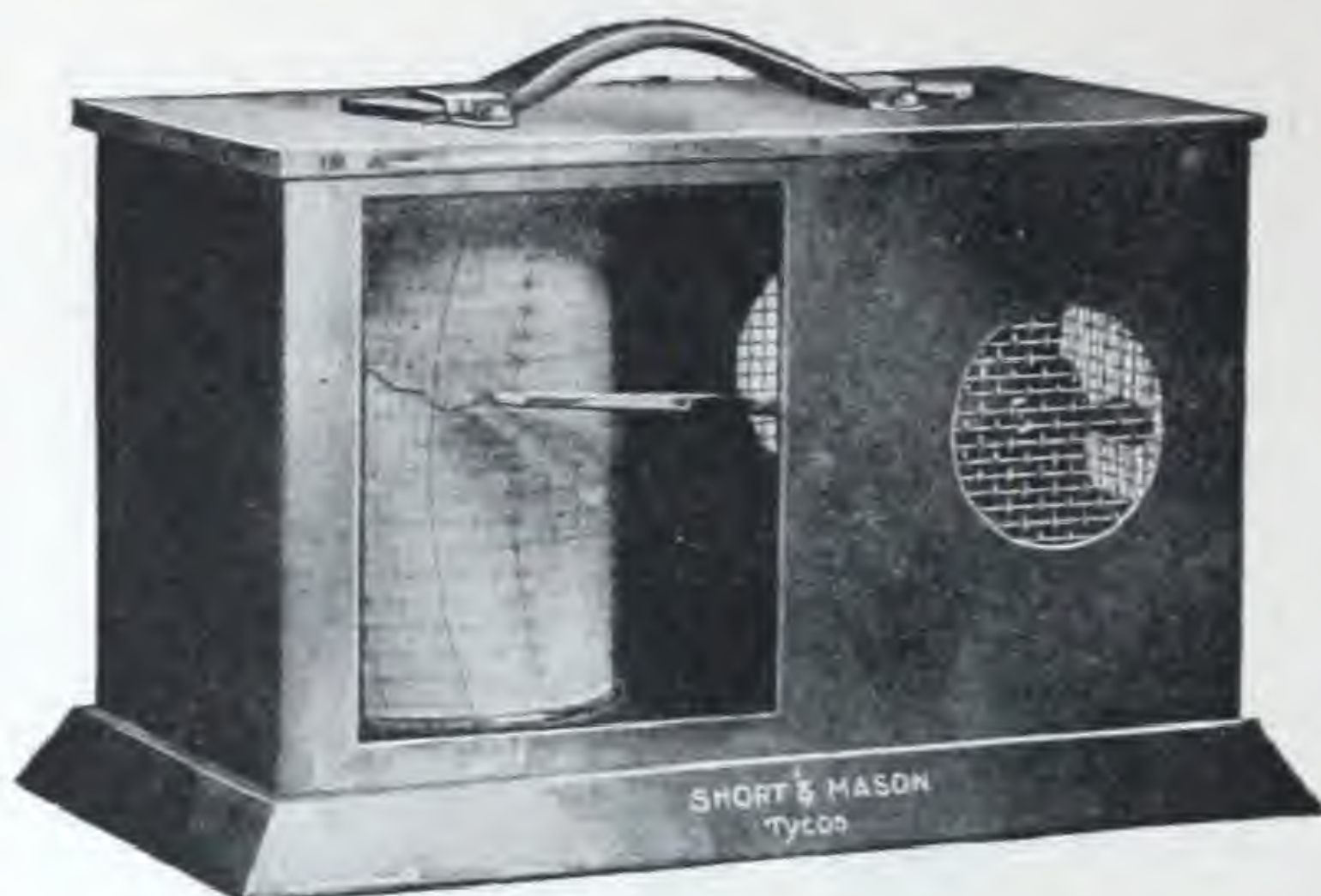
The Brunton Pocket Transit is a complete, accurate and reliable pocket instrument, which has commanded a large sale during the past ten years, and lately certain important improvements have been added. It has an aluminum case measuring  $2\frac{3}{4} \times 2\frac{3}{4} \times 1\frac{1}{8}$  inches, which completely encloses the instrument, and the size permits it to be easily carried in the vest pocket, thereby obviating the use of leather case, although several types of these are listed above. The magnetic variation is set off by means of the slotted head pinion shown in one corner of the case, which may be revolved by means of a screw driver or knife blade.

It is well adapted for use in taking courses, horizontal angles, vertical angles, and long tangents, and can be used as a level, clinometer and plumb. It is used a great deal for vein tracing.

**Transits and Levels repaired on short notice at lowest prices**



## THERMOGRAPH (RECORDING THERMOMETERS)



4242 (With Movement Enclosed)

Above instrument is fitted up in copper hinged case with padlock, and is supplied with 8-day cylinder clock.

- 4242 High Drum Clock Thermograph, chart 46 ranged—62 to +128° F., with recording lamina inside.....
- 4243 Low Drum Clock, ranges 0 to 100° Fahrenheit, 20° to 120° Fahrenheit, 60° to 200° Fahrenheit, 0 to 50° Fahrenheit, 15° below to 30° above Reaumur 30° below to 110° above, Fahrenheit.....

EACH

The movement of these Thermographs consists of a bimetallic lamina, arranged in such a manner that there are no levers, other than the pen arm used in its construction.

This construction insures rigidity, overcomes all lag or creep and friction, and is more sensitive than the mercurial thermometer to changes in temperature.

The instruments can be arranged to show temperatures covering any 75° F., 150° F., or 300° F., and charts are sent plain so they can be figured at the will of the user.

As an assistance to the setting of the instrument, the following rule should be noted:

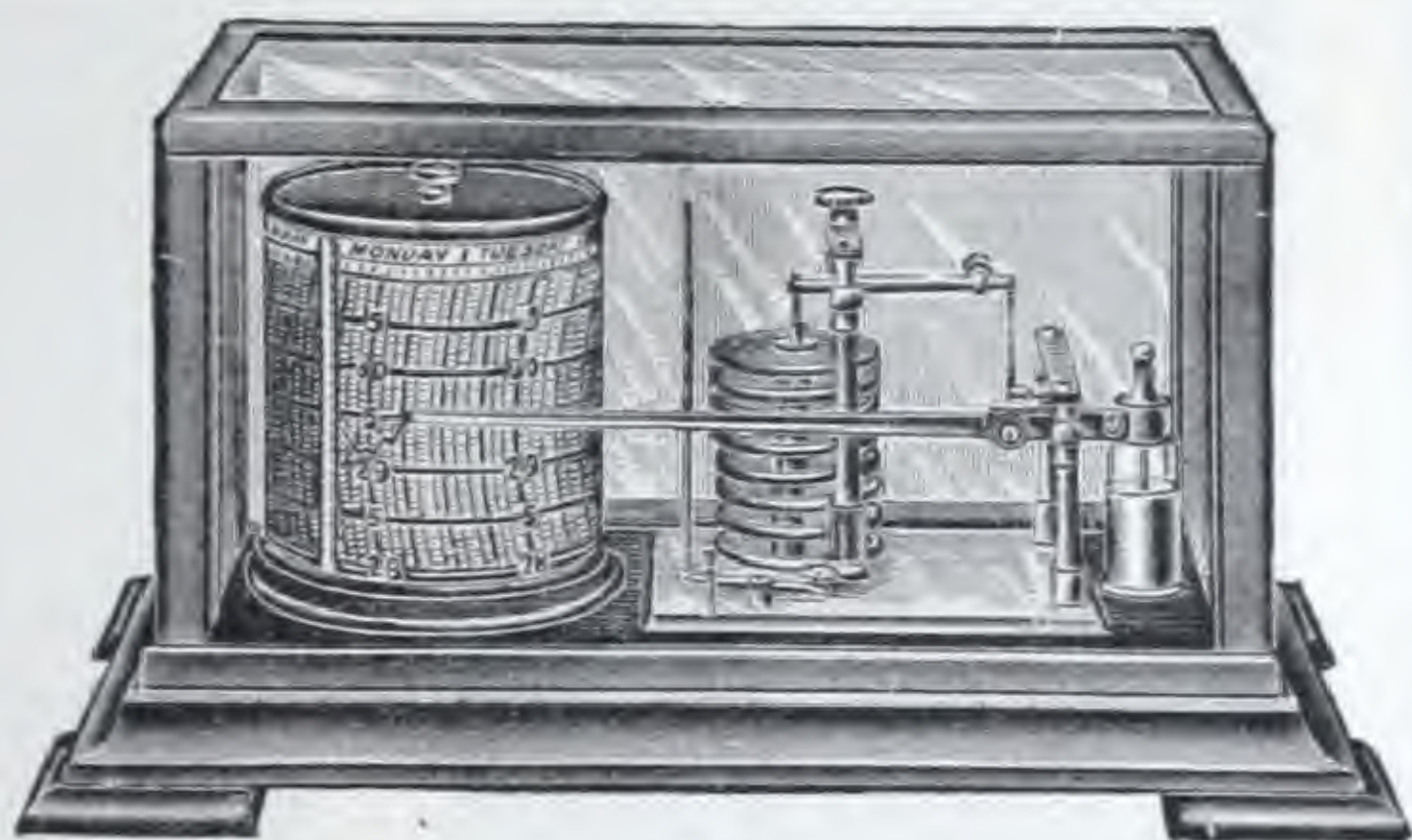
If a range of 150° F. was permissible on the instrument to be used, the first thing necessary is to figure the chart in the manner desired. As an instance suppose it was arranged with the 50° at the bottom of the chart and 200° at the top, covering 150° F. from lowest to highest point. The chart should then be placed round the clock drum and the reading of the Kew standard mercurial thermometer taken. Imagine it reading 65° F. At the end of the pen arm will be found a screw securing it to the bar, running at right angles through the spiral thermometric coil. When this is loosened the arm is free to adjustment. Place the pen at the extreme end of the arm on 65° F., mark on chart (agreeing with the mercurial thermometer) and tighten screw again thus securing it to the horizontal bar. Small final adjustments can be made by the long screw at the back of the coil, with the use of an ordinary screwdriver.



## RECORDING BAROMETERS (BAROGRAPHS)

In weather prognostication a single observation of the Barometer is of little or no value, and while frequent observations will, if recorded, convey the desired information provided changes in atmospheric pressure are gradual, yet when sudden changes occur between observations such records will be missing and probably lead to a misinterpretation of "weather signs."

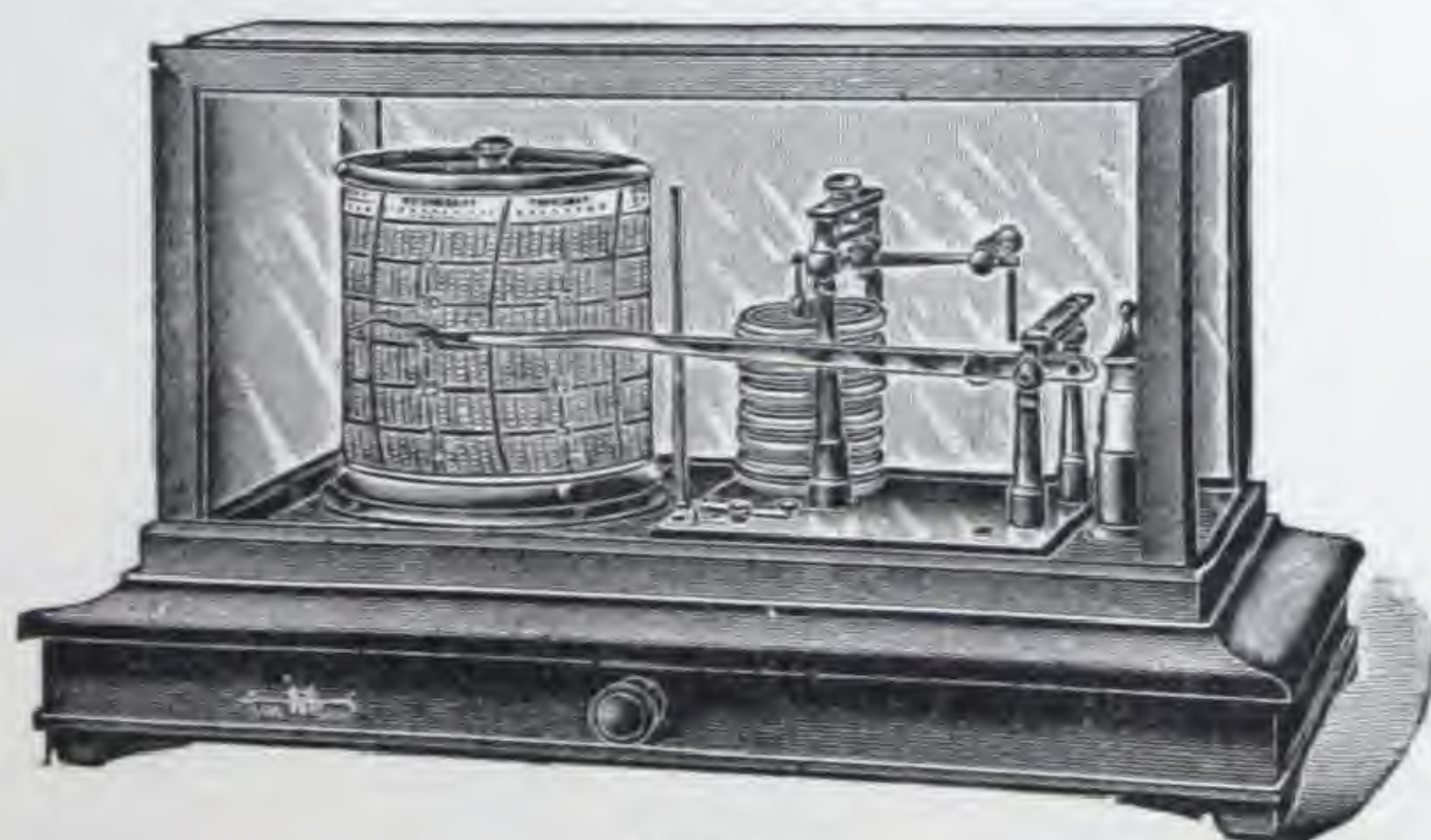
The Barograph is a most reliable form of Barometer in indicating the present-time atmospheric pressure, but its special value lies in the continuous hourly record which it creates, of every fluctuation in pressure for seven consecutive days, showing not only the extent of the various changes, but also the time of their occurrence.



4244

EACH

- 4244 Wood frame, glass case cover, in mahogany or oak.....  
 4245 Same as 4244, with beveled plate glass.....



4245 1/2

EACH

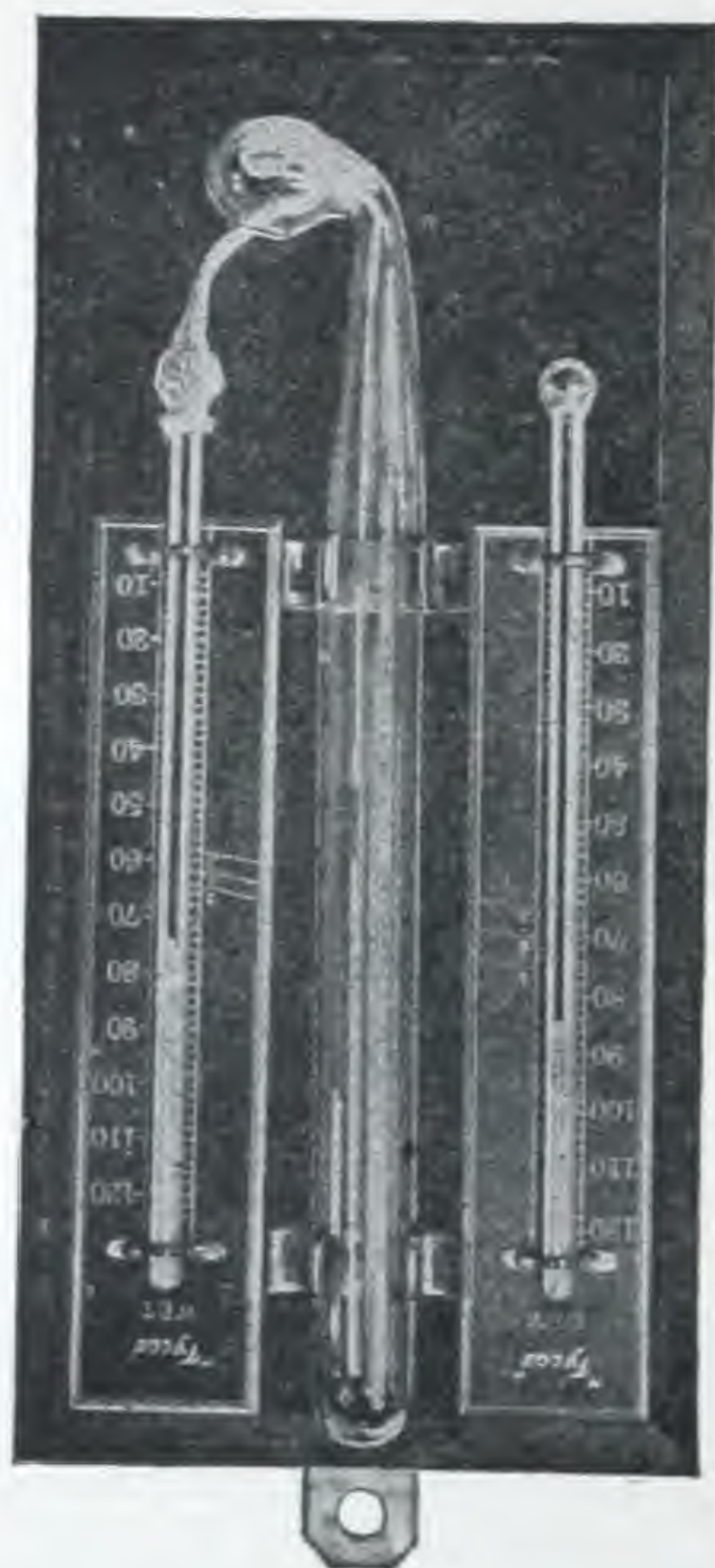
- 4245 1/2 Same as 4244, beveled plate glass, with front opening drawer,  
 two divisions, for taking used and unused charts.....



## HYGROMETRY



4258



4256

Lines 1-2-3 on Scales Indicate  
Humidity 50%



4257

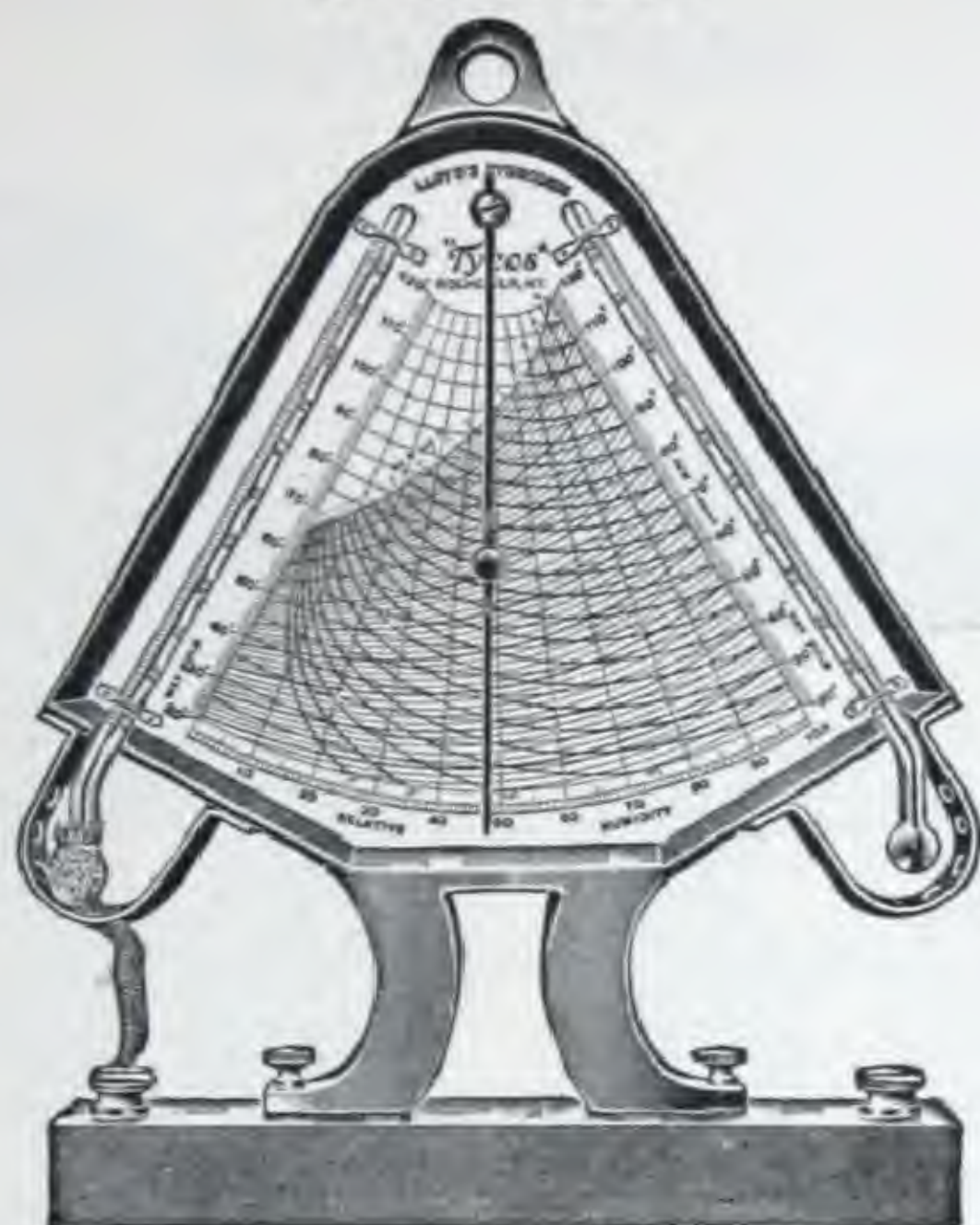
Service Pattern, Etched  
Tube Raised Milk Glass  
Scale—Certified

## Wet and Dry Bulb Hygrometers

No.	MOUNTING	SIZE INCHES	APPROXIMATE RANGE	SUBDI- VISION	LIST
4256	Polished Oak or Cherry	10½ x 4¾	0°-120°	2°	\$
4257	Oil Finished Oak . . . . .	17 x 5	30°-110°	2°	
4258	Sling Form, with Handle	16¾	0°-100°	1°	



## HYGRODEIK



4261

The Hygrodeik is the ideal Hygrometer for all industrial or domestic uses.

It is wet and dry bulb hygrometry minus the tables and computation.

The chart is a condensed, graphic presentation of all the facts given in the Hygrometer tables. While complicated in appearance, it is simplicity itself. This chart was plotted from standard tables compiled for use with the Mason (wet and dry bulb) Hygrometer, and can be relied upon as being correct.

The lines on the chart are adapted to show graphically the Relative Humidity, Dew Point, absolute amount of moisture present and the weight of water in each cubic foot of air, expressed in grains.

## Directions for Reading

Swing the index hand to the left of the chart, and adjust the sliding pointer to that degree line upon the chart which corresponds with the degree of temperature shown upon the engraved stem of the Wet Bulb Thermometer. Then swing the index hand to the right, until the sliding pointer intersects the curved line which extends downward to the left from the degree line upon the chart corresponding with the indicated temperature of the Dry Bulb Thermometer. At this intersection the index hand will point to the Relative Humidity on the scale at bottom of chart.

For example:—Should the temperature indicated by the Wet Bulb Thermometer be  $72^{\circ}$  and that of the Dry Bulb  $86^{\circ}$ , the index hand will indicate Relative Humidity 48% when the pointer rests on the intersecting lines of  $72^{\circ}$  and  $86^{\circ}$ .

Observe the intersection as above, and follow the curved line passing through it, which runs from the top downward to the right, to the point of contact with the Dry Bulb scale. The degree ( $65$ ) at this point on that scale is the Dew Point. The figure at the upper end of this line gives the absolute amount of water in grains (6.8 grains) per cubic foot of air.

## Hygrodeik

Metal Dial, Standing Form, Air Range

EACH

4260 Polished Brass Frame, range  $20^{\circ}$ — $120^{\circ}$ F.....

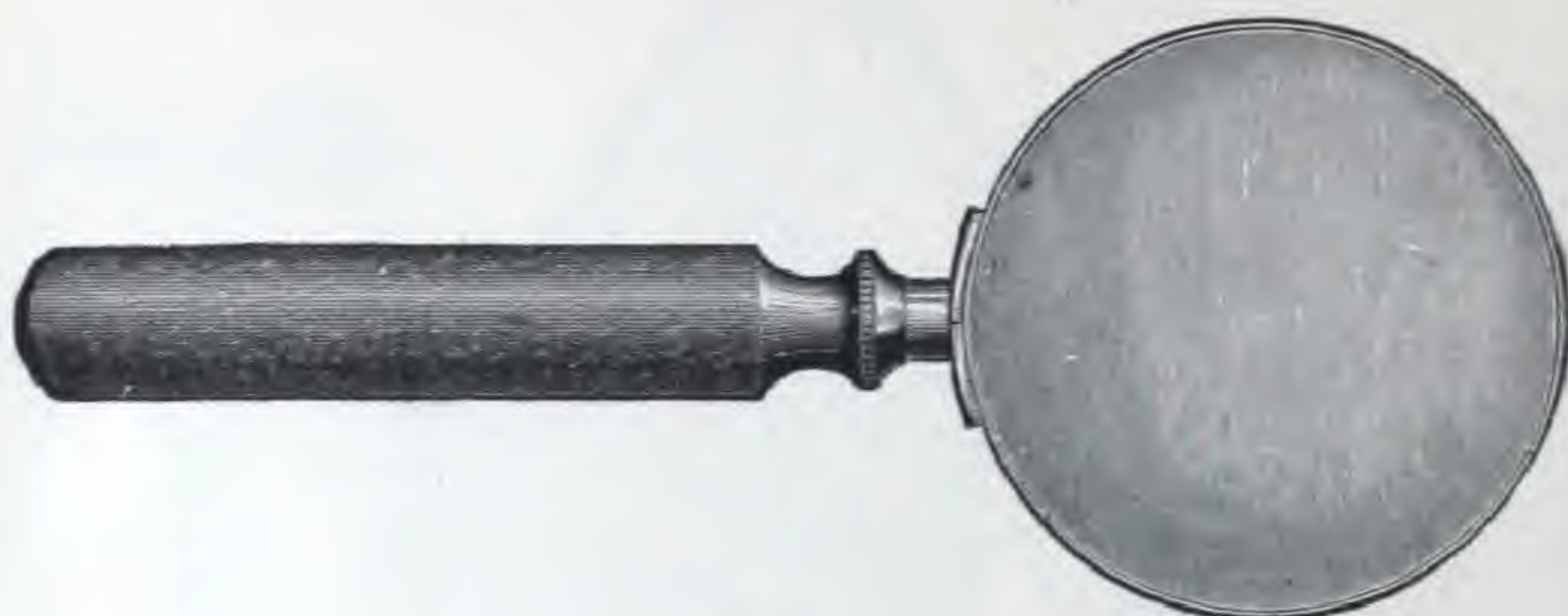
Metal Dial, Hanging Form, Air Range

4261 Polished Brass Frame, range  $20^{\circ}$ — $120^{\circ}$ F.....

No. 4261 is specially recommended for mine use.



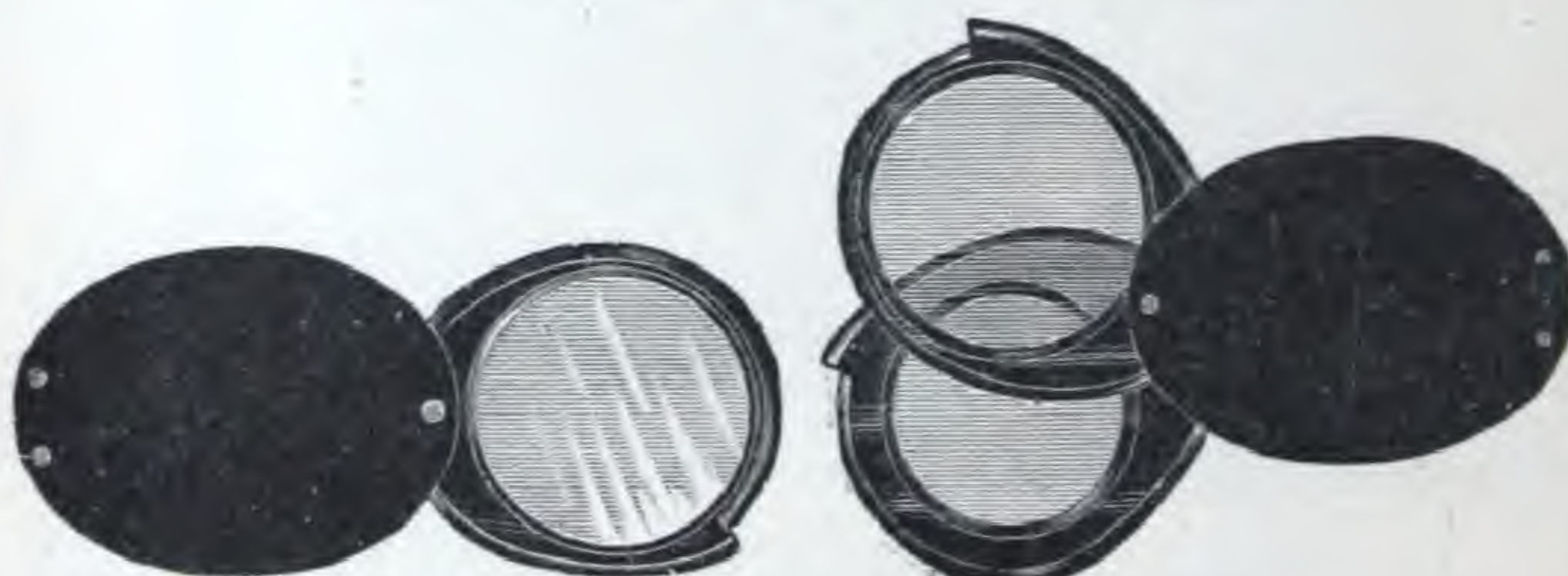
## READING GLASSES



4305

4305	Reading Glass, ordinary size.					
	Inches.....	2½	3	3½	4	4½
	Each.....	\$				5
4305R	Reading Glass for reducing.					
	Inches.....	2½	3	3½	4	
	Each.....	\$				

## POCKET MAGNIFYING GLASSES



4306

4307

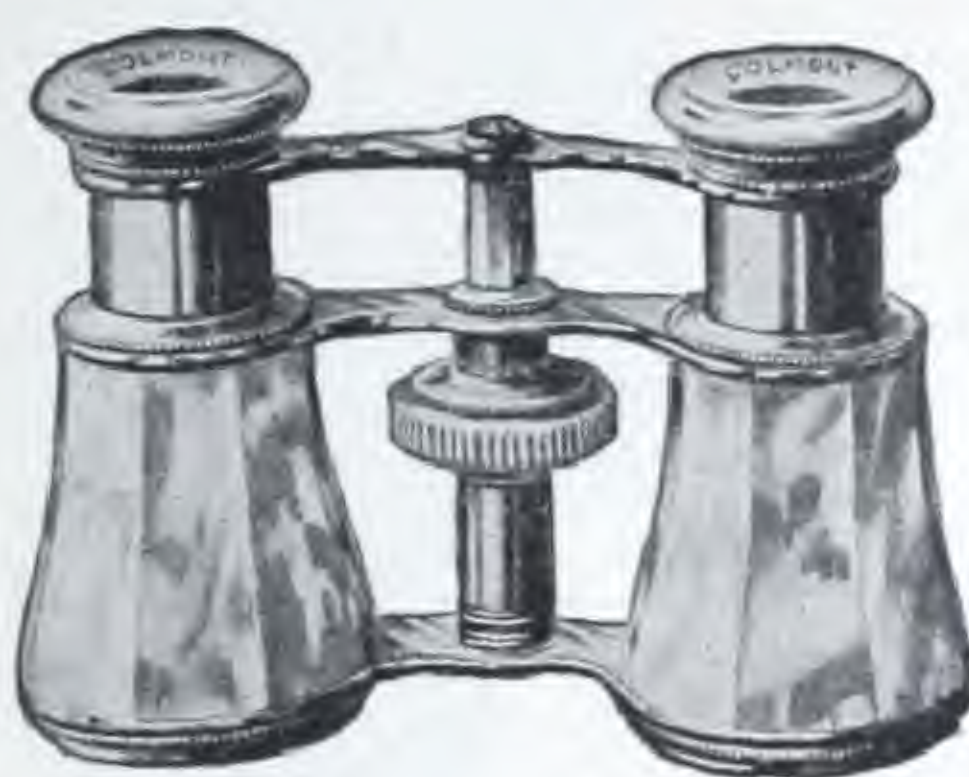
4306	Mounted in hard rubber, oval, one lens.				
	Diameter, inches.....	¾	1	1¼	1½
	Each.....	\$			
4307	Mounted in hard rubber, oval, two lenses.				
	Diameter, inches.....	½ and ¾	¾ and 1	1 and 1¼	
	Each.....	\$			
4308	Coddington lens, metal folding frame, nickel-plated.				
	Power of Lens.....	7.5x	10x	14x	20x
	Each.....	\$			
4309	Thread counter, brass frame, ½-inch field.....	\$			
4310	Magnifier, three legs, brass, screw adjustment, 1-inch diameter....	\$			



## OPERA GLASSES



4312



4315

- 4312 Opera Glass, black, Lemaire, 13 lines, leather covered, japanned tubes. . . . . EACH
- 4313 Opera Glass, 15 lines, same as No. 4312, but larger. . . . .
- 4314 Opera Glass, 17 lines, same as No. 4313, but larger. This can also be used as a bird glass. . . . .
- 4315 Opera Glass, 13 lines, Lemaire, white, smoke or oriental pearl with gilt tubes. . . . .
- 4316 Opera Glass, 15 lines, same as No. 4315, but larger. . . . .

All the above have best morocco cases.

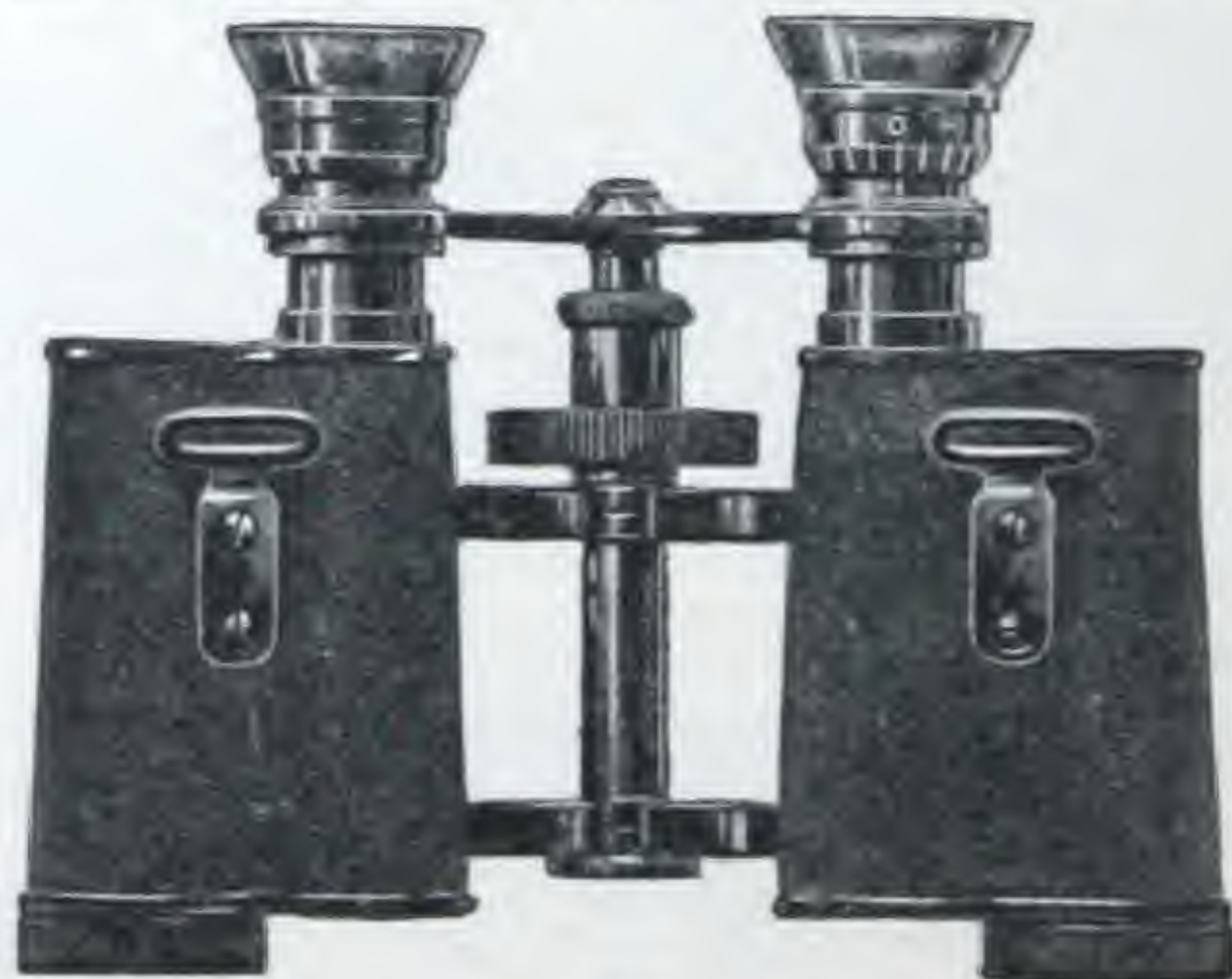


## FIELD AND MARINE GLASSES



4320

- 4320 Field Glass, large lens, high power.....  
 4321 Field Glass, similar to above, but smaller.....  
 4322 Field Glass, Lemaire, 24 lines, best lenses, largest field. The standard glass.....

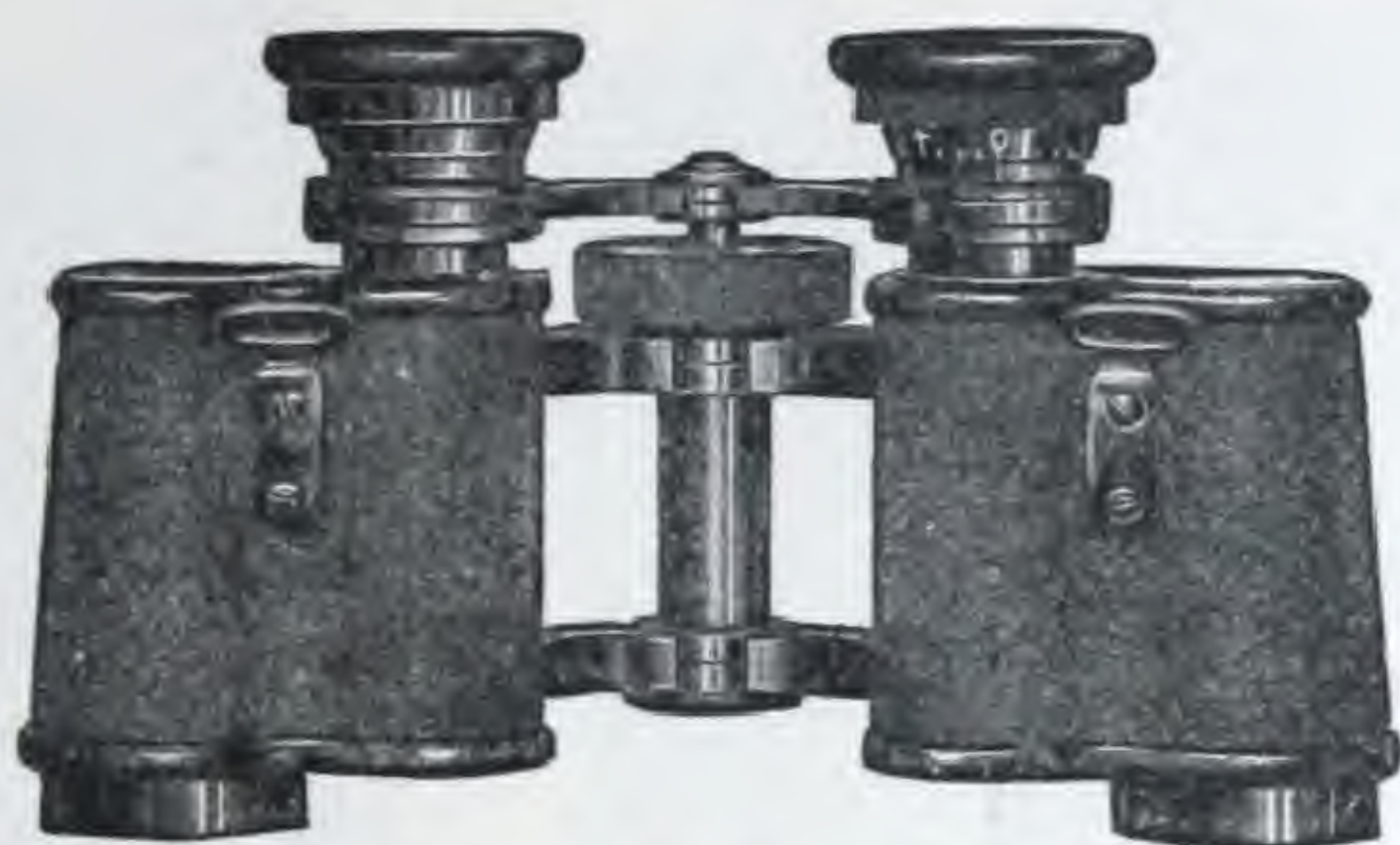


4323

- 4323 Elliott Special Prism Binocular, 8 power.....  
 4324 Busch Prism Binocular, 6, 8 and 12 power.....  
 The above Field Glasses and Binoculars are guaranteed and complete with straps and cases. The above prices are strictly net.



## FIELD AND MARINE GLASSES—Continued.



4327

The above cut illustrates the Zeiss Stereo Binoculars, used by the armies and navies of the great nations. These are "dwarf in size; giant in power." Pocket size, light weight, simple construction, any desirable power. One hand focusing attachment suits it to everyone's use. Without attachment it is just as convenient for individual use. These glasses have advantages possessed by no other. Immense field of view. The field is at least three times as great as the old-style field glasses, and a flatness, clearness and brilliancy of field is obtained that is not surpassed. Perfect stereoscopic image.

EACH

- 4326 Bausch & Lomb-Zeiss Stereo Binocular, 6X, 21 mm. diameter,  
in case with straps.....
- 4327 Bausch & Lomb-Zeiss Stereo Binocular, 6X, 30 mm. diameter,  
in case with straps.....
- 4328 Bausch & Lomb-Zeiss Stereo Binocular, 8X, 25 mm. diameter,  
in case with straps.....
- 4329 Bausch & Lomb-Zeiss Stereo Binocular, 12X, 30 mm. diameter,  
in case with straps.....
- 4330 Bausch & Lomb Stereo Prism Marine Glass, 10X, 45 mm.  
diameter, in case with straps.....



## CABINET THERMOMETERS



5100E



5101E

## STANDARD GRADE

Each stamped with Elliott trademark. Magnifying mercury or spirit seasoned tubes, black oxidized brass bevel edged scales, white filled figures, polished bronze screw clasps and guards, extra finish wood back in golden, weathered or flemish oak, ebonized, or white enamel.

**5100E** (Outdoor range)  $10^{\circ}$  to  $40^{\circ}$  below zero to  $120^{\circ}$  F. above.

Inches..... 6 8 10

Each.....

**5101E** (Indoor range) Approximate range,  $20^{\circ}$  to  $100^{\circ}$  F.

Inches..... 6 8 10

Each.....

**5102E** (Outdoor range) Silver deposited figures, black oxidized finish.

Inches..... 6 8 10

Each.....

**5103E** (Indoor range).

Inches..... 6 8 10

Each.....



## CABINET THERMOMETERS



5121E



5120E



5140E

Each stamped Elliott, magnifying mercury or spirit tubes, black oxidized brass scales, white filled figures and graduations, brass screw clasps and guards. Wood back in natural, weathered or Flemish oak or red cherry finish.

**5120E** (Outdoor range)  $10^{\circ}$  to  $40^{\circ}$  below zero to  $120^{\circ}$  F. above.

Inches..... 8 10

Each .....

**5121E** (Indoor range) Approximate range,  $20^{\circ}$  to  $100^{\circ}$  F.

Inches..... 6 8 10

Each .....

**5140E** Inches..... 7 8 10

Each .....



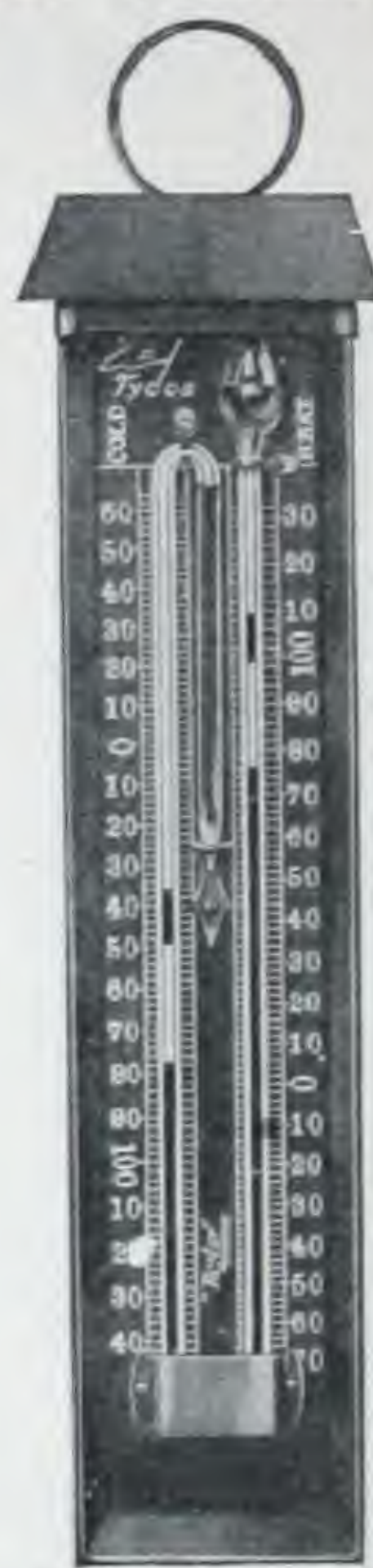
## JAPANNED TIN AND COPPER CASE THERMOMETERS



5420E



5400E



No. 5452E



Magnifying mercury or spirit seasoned tubes, black oxidized brass scales, white filled figures, brass screw clasps.

Scale range, 10° to 40° below zero for mercury tubes and 20° to 60° below for spirit tubes to 120° F. above.

5400E	Black japanned, heavy tin case.			
	Inches.....	8	10	12
	Each.....	\$		
5400PE	Copper case.			
	Inches.....	8	10	12
	Each.....	\$		
5420E	Black japanned tin case.			
	Inches.....	8	10	12
	Each.....	\$		
			8"	10"
5452E	Self-Registering Thermometer, black-japanned tin case, black-oxidized brass scale, white-filled figures. Made in 8-inch and 10-inch sizes. Approximate scale range 10° to 40° F. below zero to 120° above. Each.....			
5155E	10-inch coppered case, silvered brass scale, black filled figures. Each.....			



## SCIENTIFIC BOOKS

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